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Wider Sheet Bars Advocated

The Matter of Balanced Rigging in the Stands—Economies Calculated and Two Layouts Shown by Way of Illustration

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THERE is perhaps no individual branch of the iron and steel industry in the United States that presents such an expanding field as the manufacture of sheets. In roofing sheets the gages and sizes have a tendency to run heavier and larger than the staple roofing sheets of the past. Automobile stock runs in larger sizes and heavier gages than the 22 and 20 gage sheets which used to form the bulk of the roofing requirements. The use of sheets for other purposes than roofing is growing by leaps and bounds. Car siding for passenger cars and trim for interior of passenger cars must in the future be of sheet metal, as the supply of suitable timber is being exhausted and its replacement by means of the slow natural growth of the harder ornamental woods need not be counted on as a practical future supply except in exceptional cases such as private cars and the like where considerations of expense are neglected. The same applies to office furniture and office sash, trim, etc. Equally, ship's cabin trim and fixtures, berths, etc., will largely be of sheet metal in the future for the same reason, shortage of ornamental timber.

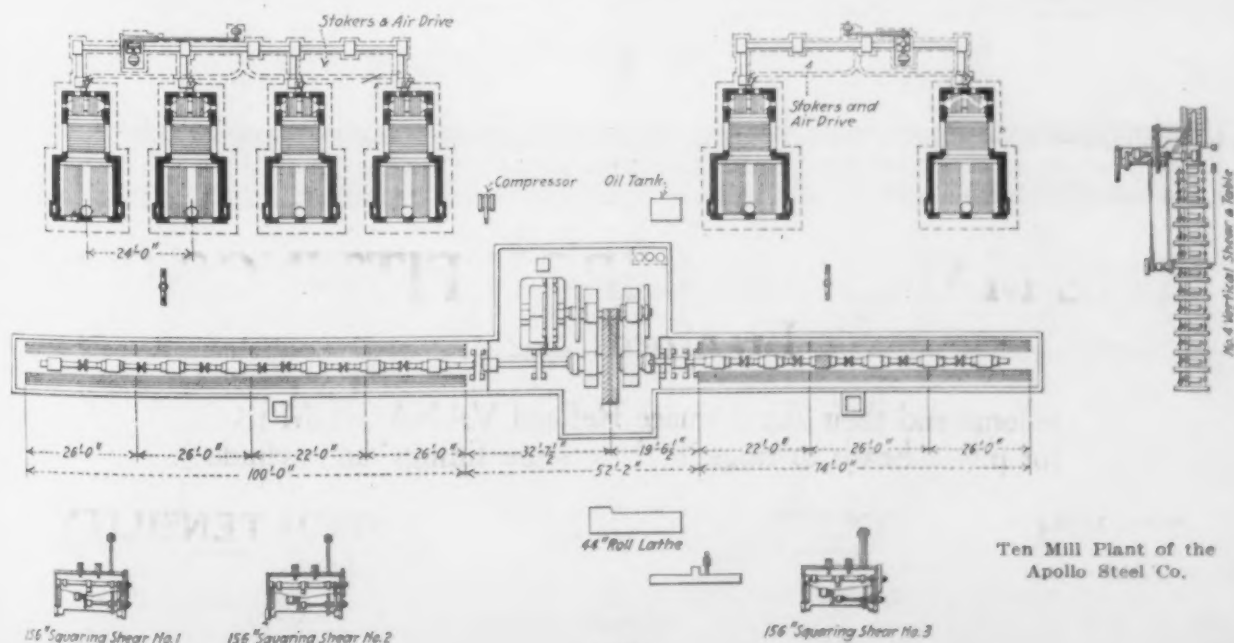
All of these comparatively new and growing uses

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for sheets of iron and steel run to the heavier gages. The flat sheet, 27 to 28 gage requirements, will always be with us, with a tendency to increase in volume rather than decrease; but the sizes of 6 to 8 ft. long and 24, 30 and 36 in. wide will probably remain unaltered. These lighter sheets can well be efficiently and economically rolled from 8-in. bars of varying thickness, seldom, however, exceeding $\frac{7}{8}$ in., on jump roughing mills.

The bars come from the steel works in about 30-ft. lengths and it has become customary to roll these in widths of 6, 7 and 8 in. in varying thicknesses. They are sheared at the sheet mill into sheet lengths. The length of the sheared bar constitutes the width of the sheet, there being little or no elongation of the bar in the direction of its length in the process of conversion from bar to sheet, the reduction of area and consequent elongation of the sheet taking place in the direction of the width of the bar.

There are many advantages in the use of jump roughing stands, whether these are used on the so-called Welsh system, roughing and finishing on the same stand, or whether a stand of sand roughing rolls is installed for two stands of chilled finishing



Ten Mill Plant of the Apollo Steel Co.

rolls, as has been the usual American practice. The outstanding gain is the elimination of the pinion stand, and minor advantages consist of the cheaper type of housing required, as the balancing rigging is not necessary in the case of a jump rougher.

This brings up the question of why pinion stands and balanced roughing stands have been considered necessary in the past. In sheets the thickness of the bar is the direct factor governing the size of the finished sheet, as this is function of weight. Assuming a finished sheet is to be 6 ft. x 30 in., 24 gage, the sheared sheet would weigh 1.02 lb. per sq. ft., or 15.3 lb. A good percentage of waste can be taken at 10 per cent and as two sheets come from one bar (they are doubled before reheating) the bar would be 31 x 8 about 15/32 in. or 33.66 lb. in weight.

This bar will easily enter the pass of a jump rougher, the top roll of which is driven by friction alone so that for this and similar size and weight sheets the Welsh system is economically applicable.

There is, however, a limit to the size sheet that can be rolled on a jump rougher. A thicker bar than 1 1/4 in. is very difficult to get into the pass of the jump rougher, as the top roll is not balanced (this roll rests on the bottom driven roll) and the gap has to be forced by the bar itself, making the rollers work very laborious. Of course the top roll may be balanced although it is not driven. This balancing renders the work of the roller in the first pass much easier but increases the initial cost of the housing and rigging.

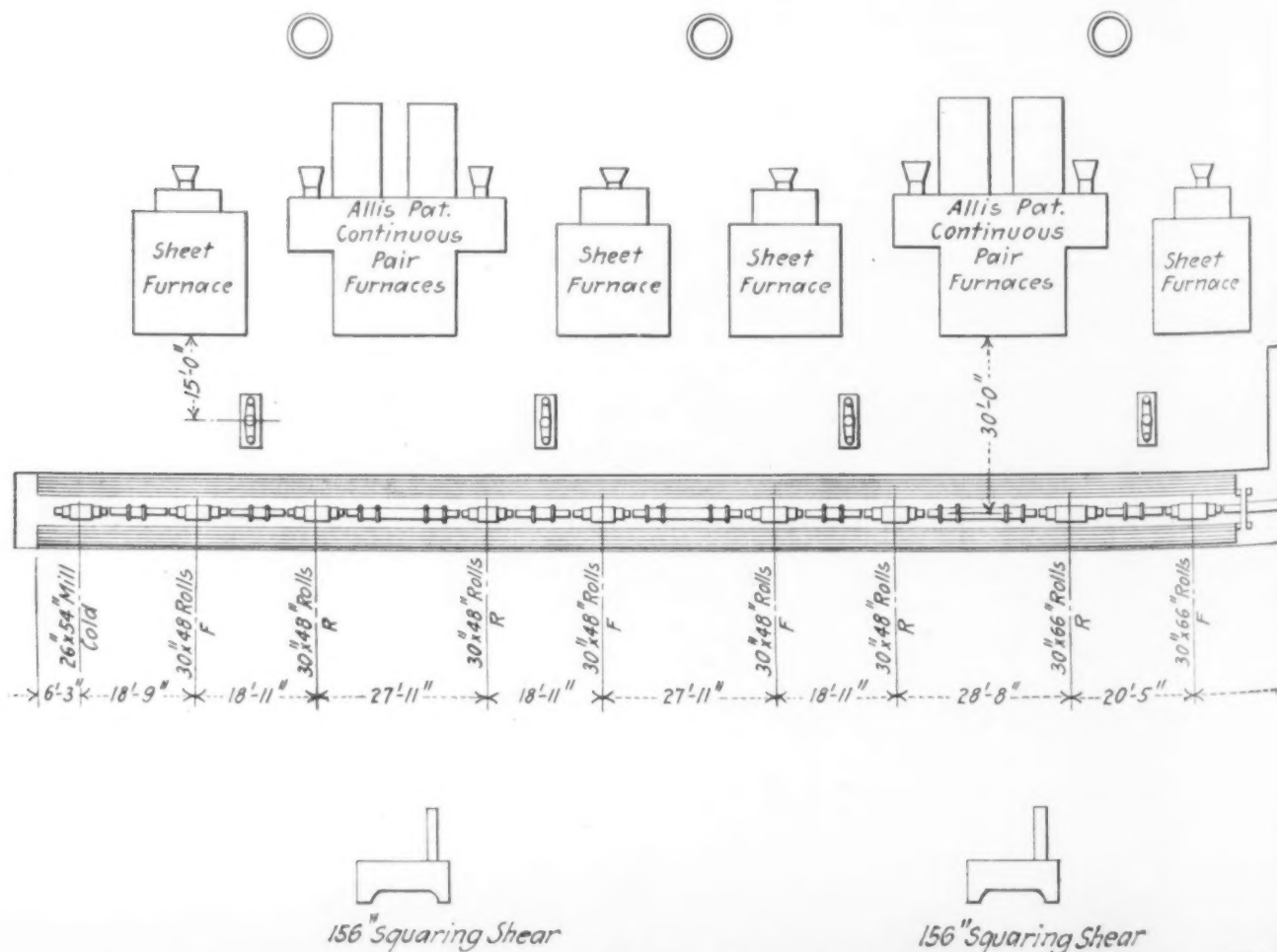
From this it will be seen that the size of sheet that it is possible to roll on the Welsh system is limited to 6 ft. x 30 in. x 16 gage, or 12 ft. 10 in. x 36 in. wide in 24 gage. It is to be observed, however, that in actual commercial practice 12 ft. by 36 in.

wide would be the limit rolled in 24 gage, for which a slightly lighter bar than 1 1/4 in. thick would be required. For large sheets in 28 gage, the limit is 8 ft. x 36 in. wide, and again a lighter bar is used.

Assuming that sheets 10 ft. long x 36 in. wide and of 16 gage are required, the bar would have to weigh 84.15 lb., or be over 2 in. thick. This thickness of bar would necessitate the use of a balanced top roll for the roughing pass, and to grip the thickness this top roll would have to be driven, necessitating the use of a pair of pinions. Thus it appears that the main reason for using the pinions is the fact that the practice of the trade has been to confine the width of the sheet bar to 8 in.

If the bar were 12 in. wide by 37 in. long, the square area would become 444 sq. in. and taking 1 cu. in. of steel as weighing 0.283 lb. the thickness of the bar to give the required weight of bar 168.30 lb. would be 1.339 in. which it is just possible to rough through a balanced jump rougher. It must be remembered, however, that a sheet 10 ft. long x 36 in. wide x 16 gage is an extreme out size and would be rolled very seldom or never in actual commercial practice, and as a consequence all the commercially used sheets would come well within the 1 1/4-in. limit of thickness, and for a mill whose product would be mainly used for automobile or car siding stock it would be well to have all the roughing stands balanced, although the expense of the extra balancing rigging could well be spared in the ordinary mill designed for the usual run of commercial products in the way of sheets.

It seems to the writer that there is no reason why the bars should not be taken off the bar mill 12 in. wide, at least no reason that is prohibitive. In fact, this would make for a bar mill economy, as it would increase the output of the bar mill. It is



Mill Built in a Tropical Country, Six Stands for Both Roughing and

obvious that the larger the sectional area of the finished bar the shorter time it will take to produce a given tonnage, and the wider bar would necessarily mean a decreased amount of duty for the roughing pass in the sheet mill for the reason that the reduction of area and consequent elongation of the embryo sheet is already 50 per cent from 8 in. wide to 12 in. wide before the first pass. The elongation from bar to sheet is always in the direction of the width of the bar.

Thus running on an 18-in. finishing mill at 40 r.p.m., 5 ft. in length of 12 x 1/2-in. bar would weigh 1320 lb. and would take 1.59 sec. in the finishing pass.

The corresponding weight of 8-in. bar would be 3/4 in. thick if 5 ft. long, and would take up the same amount of time on the bar mill, but to reduce the work of the roughing pass in the sheet mill to the equivalent of the 12 x 1/2-in. bar would be impossible on account of the weight of the bar being too light.

Thus we see that taking 30 per cent reduction of area on a 12 x 1/2-in. bar 24 in. long, weight 40.80 lb., cubical contents, 144 cu. in., the first pass would give an embryo sheet 17.14 in. long, 24 in. wide and about 23/64 in. thick, having a cubical content of 144 cu. in., and would be 0.363 sec. in the pass, the diameter of the rolls being 30 in. and the speed of the mill train 30 r.p.m.

To get this length from an 8 x 3/4-in. bar at the same amount of reduction of area, namely, 30 per cent, and with the same diameter of rolls, 30 in., and the same speed of mill train, 30 r.p.m., would require three passes. The first reduction would be from the 8 x 3/4-in. bar, 24 in. long, of 40.80 lb. weight, and 144 cu. in. contents. The area to be reduced, 24 x 3/4 in., or 18 sq. in., would at 30 per

cent reduction become, after the first pass, 12.60 sq. in., and the length of the embryo sheets 11.428 in., the cubical contents being 144 cu. in. The time in the first pass would be 0.242 sec.

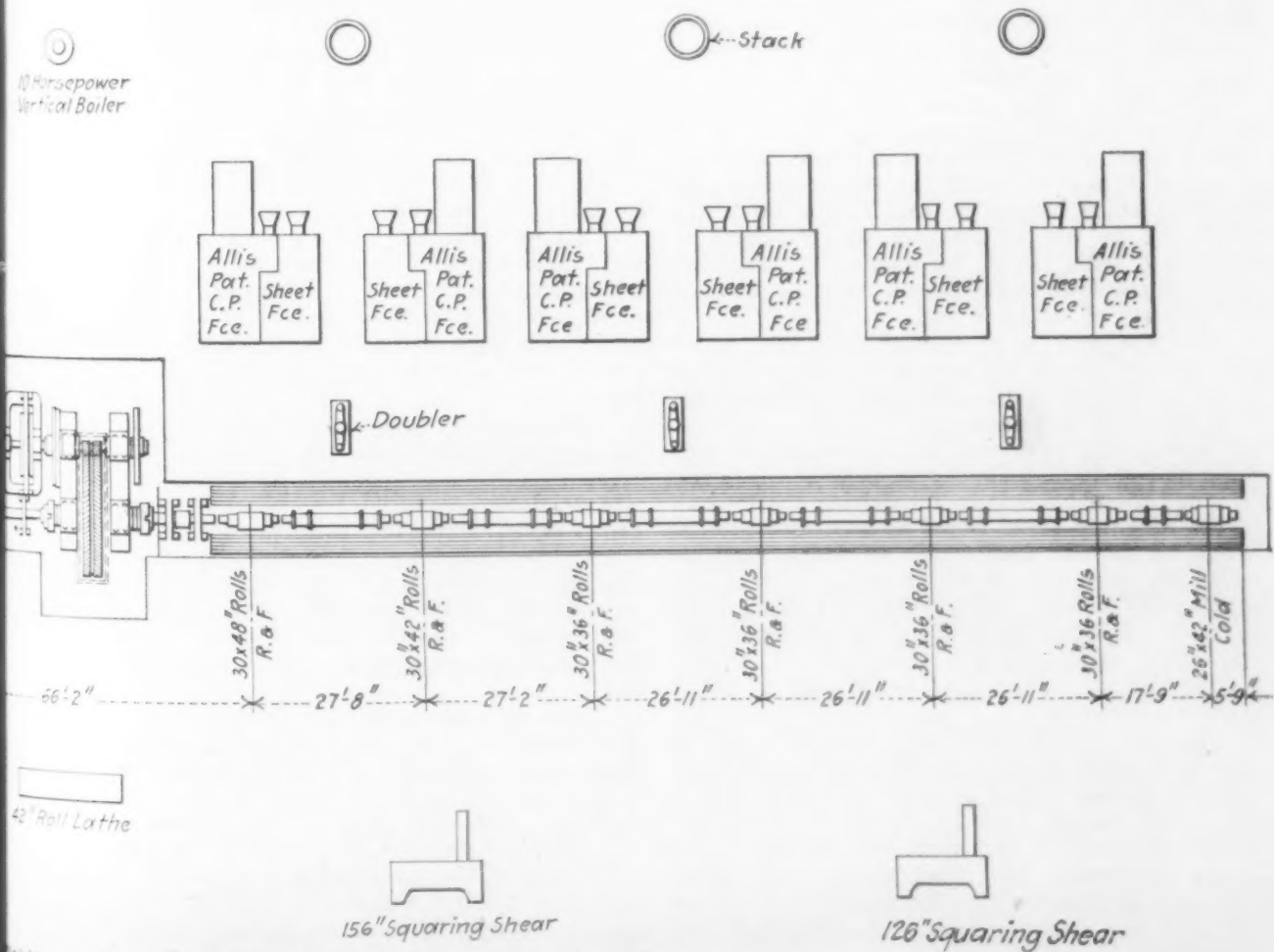
Carrying the same reduction of area to the second pass, viz, 30 per cent, we have this condition: Embryo sheet 11.428 in. long x 24 in. wide x about 33/64 in., having an area to be reduced of 12.60 sq. in. and a cubical content of 144 cu. in. The area after the second pass would thus become 8.82 sq. in., which would mean an embryo sheet 16.31 in. long x 24 in. wide x about 23/64 in. thick, having a cubical content of 144 cu. in., and the time in the second pass being 0.346 sec.

With the first pass on an 8-in. bar and the rolling time of 0.242 sec., and with 10 sec. interval for the catcher to take the bar and pass it over the top roll back to the roller, 10.242 sec. elapses until the bar reaches the roller for the second pass. The area after the second pass is 8.82 sq. in., and allowing 30 per cent reduction of area, the area after the third pass would be 6.17 sq. in. and the length of the embryo sheet would be 23.32 in.

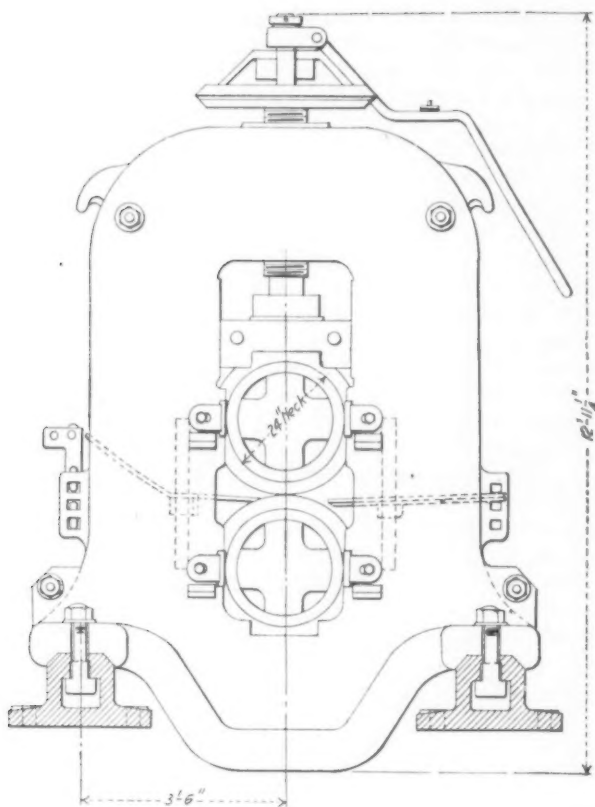
The comparison then would be:

First pass, 12-in. bar.....	0.363 sec.	Length, 17.14 in.
Interval, 10 sec.		10.363 sec.
Second pass, 12-in. bar.....	0.519 sec.	Length, 24.48 in.
Total time,		10.882 sec.
First pass, 8-in. bar.....	0.242 sec.	Length, 11.428 in.
Interval, 10 sec.		10.242 sec.
Second pass, 8-in. bar.....	0.346 sec.	Length, 16.31 in.
Interval, 10 sec.		20.588 sec.
Third pass, 8-in. bar.....	0.494 sec.	Length, 23.32 in.
Total time,		21.082 sec.

Or, in other words, the length of the embryo sheet



Rolling and Four Separate Roughing and Four Separate Finishing Stands



Jump Roughing Mill

from the 12-in. bar would be greater after the second pass than the length of the embryo sheet from the 8-in. bar after the third pass.

The time comparison would be for the 12-in. bar 10.882 sec. from bar to the 24.48 in. embryo sheet. For the 8-in. bar 21.082 sec. to the 23.32-in. embryo sheet. This saving of time must necessarily increase the output per stand.

An added economy is due to the fact that the heat is dissipated in direct ratio to the time elapsed from the taking of the bars out of the furnace, and, of course, it is obvious that the more passes on the roughing stand before the heat is dissipated, the better results will be obtained both in finish of sheets and reduction of the number of passes required to get down to gage in the finishing pass and the corollary of saving in fuel.

The economies to be effected in capital outlay are obvious. First, the outstanding feature is the entire elimination of the pinions and their housings. It is very risky to assume even an approximate cost for rolling mill equipment in the present market, but a pair of 30-in. pinions with their housings and caps and the extra spindle for driving the top roll of the roughing stand would at least cost \$15,750 assembled on the shoe plates, to which must be added the extra cost of the balancing rigging, approximately \$3,000. There would be a small offset to this in the shape of the extra cost of spindle and one extra spindle carrier approximately \$4,000, leaving the net saving \$14,750 for each stand of pinions eliminated.

The item of lubrication for the pinions would, of course, be eliminated, thus effecting a very considerable annual saving in operating costs, and to this annual saving must be added the expense of upkeep and renewals of pinions and brasses.

As illustrating the small amount of change necessary to dispense with the pinions in an existing mill, two cuts of layouts of sheet mills are appended.

The first shows a ten-mill plant which was designed and built by the United Engineering & Foundry Co., Pittsburgh, for the Apollo Steel Co., Apollo, Pa. It is arranged with 6 finishing mills for light sheets, 22 gage to 28 gage. These rough and finish on the same stand. On the other side of the drive are two jump roughers and finishers, a stand of pinions and a balanced rougher and a stand of finishing rolls. This mill would take care of a general-purpose trade, mostly in the light and roofing requirements, but being capable of producing a considerable tonnage of heavy sheets up to 16 gage 48 in. wide.

The furnaces, as shown, are the tandem combination type while the drive is electrical, consisting of a General Electric motor, class 30, 1400 hp., type I, form M, 2200 volts, 340 r.p.m., with a helical cut drive gear reduction having two flywheels. The bar shear, as shown, is a No. 4 vertical, with tables made by the United Engineering & Foundry Co., and is electrically driven.

To dispense with the pinions and pinion housings in this case would simply mean the substitution of an 18-ft. spindle for the three 5-ft. spindles and drop the pinions and housings entirely. Were this mill designed for an output of all automobile or heavy stock it would be necessary to equip it with four sets of pinions and housings and four stands of balanced roughers if the bars were confined to 8 in. in width. This would also cut down the number of finishing mills to eight, if it were desired to use the same motor and drive. The saving in investment in this case would be correspondingly greater on account of the three extra pairs of pinions required.

The second layout shows a similar mill, but in this case the pinions are omitted. As in the previous design, on one side of the drive are arranged six finishing mills on the Welsh system, viz., roughing and finishing on the same stand. This mill is also a general purpose mill, the bulk of the output being light sheets 22 to 28 gage, for which Welsh mills are suitable. The drive is identical with the one previously illustrated, except that the motor is 1500 hp. On the other side are arranged four finishing and four jump roughing mills.

This mill was laid out for service abroad and had to take care of a very diversified product, covering barrel sheets 60 x 60 in. of 22 gage, 144 x 48 in. of 12 gage, 84 x 36 in. of 28 gage, 84 x 36 in. of 31 gage, with some 120 x 36 in. of 16 gage, and the usual range of roofing and flat sheets in between these sizes.

It so happened that on the bar mill of the steel works of which this sheet mill was a part there was arranged a finishing pass 13½ in. wide. This pass was primarily arranged for rolling sleeper plate (an English term for railroad ties which are stamped to shape from this width bar). Advantage was taken of this fact to take off sheet bars 13½ in. wide for the heavier gages of sheets, so that it was possible to run the bars for even the extreme sizes of sheets required through a jump roughing stand.

There are many advantages in running a roughing stand for each finishing stand, advantages which far outweigh the extra consumption of power caused by running the roughing stand idle while finishing. These advantages are concerned mainly with the fact that the crews are not mixed; the roller handles his roughing pass without interference, and it is not changed by another roller who may be rolling a different and perhaps lighter gage and consequently there is much less danger of roll

breakage caused by one roller trying to pass a heavier bar through the roughing pass than it is set for, which might easily occur through inadvertence on the roller's part. Again, the one crew does not have to wait on the other for the use of the roughing stand; this often causes delay and friction between the two crews. This delay and consequent loss of heat and consequently fuel more than compensates for the extra power used. The extra roughing stand is far less costly than a pinion stand.

The leading mill on the heavy side of the drive is 66 in. and would also be used for the 48-in. width mill for 12 gage, as the heating furnace serving this stand is larger than the other furnaces on the train. Next to this 66-in. finishing stand is placed its 66-in. rougher, which is followed by a 48-in. roughing stand and its 48-in. finishing stand. The next two stands are also 48-in. roughing and finishing but reversed in position as shown. At each end of the mill train is placed a cold mill.

The furnaces shown on this layout are the Allis patent continuous pair furnaces combined with sheet furnaces on the light side of the mill and Allis patent continuous furnaces are built in pairs with independent sheet furnaces on the heavy side of the mill. These furnaces were designed by the Geo. J. Hagan Co., Pittsburgh, Pa.

In the layout shown, which was designed for use in a tropical country, the standings on both the roller and catchers side of the mill train were water-cooled as were also the furnace fronts. In both the layouts the squaring shears and doublers are arranged in practically the same locations, and the second layout is provided with a No. 4 United Engineering & Foundry vertical shear and tables not shown in the cut, but located in the same relative position as shown in the Apollo layout.

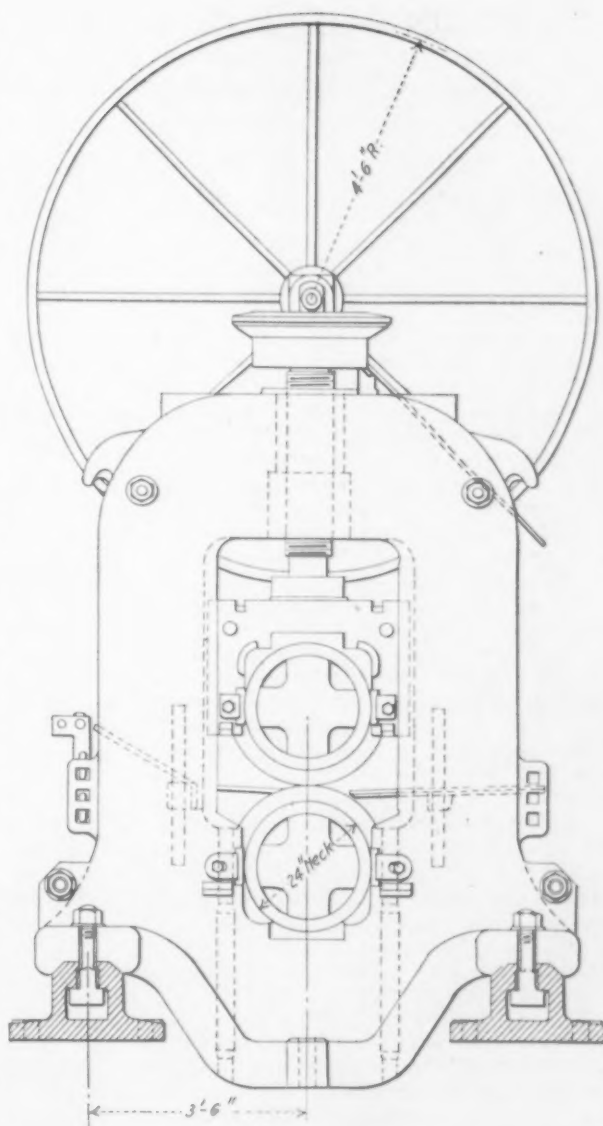
It takes more than twice the amount of power to run a pair of pinions and a driven top roll than it requires to drive a jump rougher, so that again a great saving in the power consumption is effected by using the wider bar. The economy in time effected by the greater number of passes possible on the roughing stand before it is necessary to reheat must also be taken into account as this, as before stated, makes for considerable reduction in the fuel bill.

The two cuts showing a typical jump roughing stand and a typical balanced roughing stand will serve to illustrate the very marked economy in first cost and upkeep of the jump type over the balanced type.

The jump roughing housing is a plain window housing, the casting being cored for the screw box and afterward counterbored. The only other cores are those necessary for the rest bar slots, in fact, a jump roughing housing can be a duplicate, so far as the foundry is concerned, of the finishing housings on the same train. This is another economy in the spare parts which it is necessary to keep in stock.

The machine work and fillings necessary for the jump roughing stand consist of screws and screw boxes, screw box hook bolts, spanner wheels, spanner bar, spanner wrenches, fore plates, stripper plates and rest bars. The brasses consist of top and bottom brasses and side brasses for both top and bottom rolls, with their keeper plates, and also a top rider and breaker.

The balanced roughing housing has to be provided with two long and difficult cores to accommodate the balance weight rods, besides all the cores necessary for the jump roughing housing. The



Balanced Roughing Mill

screws, screw boxes, screw box hook bolts, spanner wheels, spanner bar, spanner wrenches, fore plates, stripper plates and rest bars are also necessary in the balanced rougher while the brasses and keeper plates, riders and breakers are also identical with the jump roughing stand.

In addition, for the balanced roughing stand there is required a large steel hand wheel as shown, two pairs of bevel gears with their connecting rods, and the rods necessary to carry the balancing weights, which are also extra over the jump roughing stand. This means an extra pattern, which is comparatively a very expensive one in addition to the extra cores and extra parts and machine work done on these extra parts.

It is not economy to roll heavier sheets than 16 gage on a sheet mill. These sheets should be rolled on a jobbing mill where it is possible to utilize a much heavier slab and roll sheets to a very considerable length, shearing to the required size afterward. In fact, a well-proportioned steel works, doing a large business in sheets for the modern requirements, should always have a sheet mill and jobbing mill run in conjunction with each other. There is, in fact, a double economy to be effected by this.

A jobbing mill has its economical range between 16 gage and 3/16 in. thick and thus would be a great relief to the plate mill, as rolling 3/16-in. plate on a large plate mill is very uneconomical.

EIGHT-HOUR DAY IN FRANCE

Not Yet Operative in Metal Working Industry— The Opposing Movements

PARIS, FRANCE, April 24.—The first clause of the law of April 23, 1919, had established in all industries and commerces the 8-hr. day (or the 48-hr. week), but the second clause provides that decrees shall be enacted for each industry or trade, etc., either nationally or locally, according to cases, to carry out the above rule; and besides that whenever agreements on the working day are in existence between employers' and workmen's associations, the decrees shall take these agreements into consideration.

As I stated in a previous letter, such an agreement was signed in Paris on April 17, 1919, that is, before the passing of the law, by the representatives of the union of the iron, steel and engineering industries and the representatives of the metal workers' federation. Though more than a year has passed, the decree concerning the metallurgical industry is still on the stocks.

To explain this situation, I must repeat that the frame of mind of both the masters and men as a whole is not ripe for the easy working out of such an agreement as was signed. It is, moreover, a fact that the unruly strike of the Paris metal workers in June weakened the position of the signatories of the agreement and, to speak only of the employers, took away from them a part of their strength to bring the numerous employers who in the outset had denounced the agreement to accept and carry it out.

In the autumn, these employers, or most of them, joined other employers belonging to various industries in what the men named the preparing of a general attack on the 8-hr. day. It seems that then the employers began to realize perhaps more clearly than before that there was no hope of an early improvement in the transport system and the supply of coal and raw materials for their works; they accused the men of working lazily even when, having been given the 8-hr. day, they had promised, through their signatories of the agreement, to do their utmost to maintain the previous production. I may add that the results of the political elections in November had given to many short-sighted employers some hope that the new Parliament might repeal the 8-hr. law.

They soon felt that such a change could not be expected, and many tried to circumvent the law, the principle of which they professed to respect; they endeavored to prevail upon the men to work overtime on account of the present economic situation in France, to say nothing of making up for days when no work could be done. The 1919 law provides for exemptions, particularly in cases of national emergencies. To the mind of many this word means war, but this is too narrow a meaning. There are other national emergencies than war; for instance, there is ruin, which is the consequence of war.

Opposition to Amending 8-Hr. Law

There is no doubt that such a construction of one of the clauses of the law, whatever be the advantages of amending it, would lead, if put into practice, to the destruction of the law itself. Therefore, it is easy to understand that the men are on the lookout for its maintenance without the least modification. I do not believe that at present many labor leaders can be found to assert that the men do generally their best to increase their hourly production under the 8-hr. system. They argue that the employers have not been so far anxious to improve their plants and working methods, and chiefly that it is impossible for the men of a shop to show practically the industrial value of the 8-hr. day when on account of the shortage of coal and raw materials or difficulties of transport the shop runs, say, 5 hr. one day, 9 on the morrow, not at all the day after, and so on.

They add that all the agreements provide for a certain amount of overtime which is sufficient to meet many extraordinary circumstances; if more overtime

is actually needed, they want the matter to be discussed between employers' and men's associations, instead of the employers prevailing upon individual workmen to work as much overtime as desired.

This theoretical, so to say, position has brought many strikes, some of them very important, when the continuous increase of the cost of living has decided various trades to ask for new advances of wages. "If you want to get more money," answered the employers, "do work more hours, which, by the way, will be paid at overtime rate." And the men replied, "We have been granted by a law an 8-hr. day and this working day, with such an overtime as it provided in our agreements must yield us enough to live upon, otherwise it would be the end of the 8-hr. day law."

All this is true for most of the French big industries, and chiefly the metal working industry. And it is therefore easy to understand why the decree concerning the 8-hr. day in this industry is so difficult to draw up. The men's federation is doing its best to cause the national agreement of April, 1919, to become the legal rule in the whole country without being altered at all, or at least very little, while the employers, or rather those who have had no share in the agreement, strive hard to have the decree made as supple, as they say, as possible, a word the meaning of which is significant enough to spare me the trouble to enter into more details for the present.

A. GARNIAULT.

Proposed Inquiry as to Anti-Trust Laws

WASHINGTON, May 11.—As an outgrowth of the recent decisions of the Supreme Court in the United States Steel Corporation and other cases, Senator King, of Utah, has introduced a resolution in the Senate for an investigation by the judiciary committee relative to possible need of a revision of anti-trust laws. The text of Senator King's resolution, which was referred to the judiciary committee, follows:

Whereas, doubts have been expressed as to the effectiveness of the Sherman anti-trust act and acts supplementary thereto for the prevention and dissolution of corporations, combinations, trusts, and conspiracies to monopolize the trade in certain necessary commodities in commerce between the states; now, therefore, be it

Resolved, that the Committee on the Judiciary be, and is hereby requested to inquire into the question of the control of markets and commodities by trusts and monopolies and by conspiracies to hinder and restrain trade between the states, and to report to the Senate whether or not the Sherman anti-trust act requires revision, alteration, or extension to make the same effective, and further to report to the Senate what additional legislation may be appropriate and necessary to liberate production, manufacture, and commerce from undue impediments and restraints.

Carborundum Co. Purchases New Jersey Plant

The Carborundum Co., Niagara Falls, N. Y., has acquired from the Alien Property Custodian the plant formerly owned and operated by the Didier-March Co., Perth Amboy, N. J. The plant will be taken over at once and converted to the manufacture of a complete line of carborundum refractories for high temperature furnace work, and refractory cements.

The plant is located on a site of 24 acres fronting on the Raritan River near Perth Amboy, N. J., and is well provided with wharfing facilities and railroad connections. It consists of a modern clay working and refractory plant with a capacity of over 100 tons per day. In addition to this property, the Carborundum Co. acquires 60 acres of high grade fire clay lands at Bonhamton and a clay excavating plant in operation.

The United States Civil Service Commission announces examinations as follows: Ordnance research engineer at \$4,000 to \$5,000 a year; assistant superintendent of naval aircraft factory, at \$10 to 10.40 per day. Examinations are by mail. Applicants should apply for form 1312, stating the title of the examination desired, to the Civil Service Commission, Washington, or the secretary of the United States Civil Service Board, at the nearest custom house.

LARGE INGOT MOLD CASTING

Molding and Pouring Problems in Making a 114-Ton Iron Mold

An ingot mold of large dimensions and weight and the pouring of which involved some difficult problems in molding and pouring, particularly as regards the core, was recently made by the Buffalo Foundry & Machine Co., Buffalo, N. Y., for the Pittsburgh Crucible Steel Co., Pittsburgh. The finished mold weighed 114 tons, and was 17 ft. 2 in. long. The following account of the production of this casting is furnished by the company:

In order that a thoroughly sound casting might be obtained, it was poured on end. To accomplish this, the mold in which the casting was made was erected in a molding pit extending 14 ft. below the floor level. Due to the fact that water is reached at 8 ft. below the floor line, it was necessary to make this molding pit absolutely water tight.

In pouring castings of this character on end it is customary to cast large risers on the casting so as to provide a quantity of metal upon which the casting itself draws. An experienced foundryman will appreciate the difficulties encountered in pouring on end a casting of this weight and character.

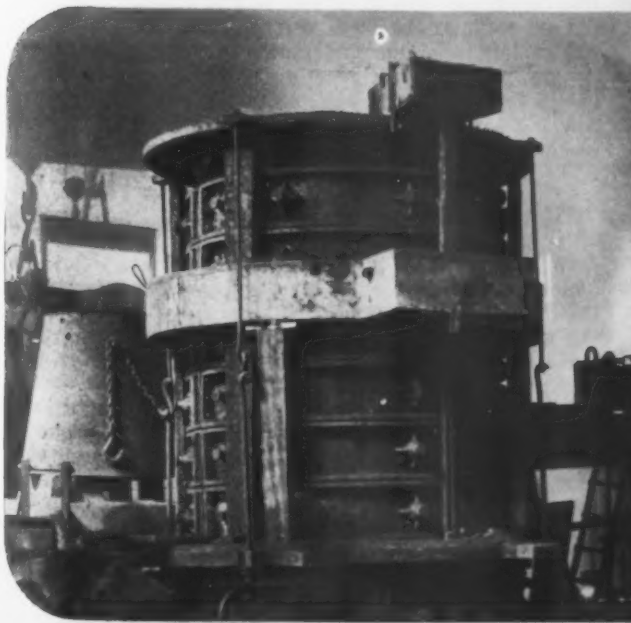
One of the important requirements was that the diameters of the mold should be the same at both ends. Owing to the height of the casting and the consequent high head of liquid metal, it can be readily seen that

the pressure at the bottom of the mold would be a serious factor in pouring this casting; in fact, the pressure at the bottom would be so great that there would be a tendency to crush the core and force the walls of the mold inward, thereby reducing the diameter of the casting at this point. One of the problems, therefore, was to construct the core so that it would be sufficiently strong to withstand this crushing tendency and at the same time be sufficiently pliant so that it would yield to the shrinking process which takes place as the casting cools. It should also be sufficiently porous to allow the escape of the gases that are generated in the core through contact with the heat of the molten metal. As the rate of shrinkage in the diameters at the bottom of the mold would be different from that at the top, it was of course necessary to regulate the diameters of the core and mold at the top and bottom to such a degree of nicety that when completely cooled and all shrinkage had ceased, the resultant diameters would be alike at both ends of the casting.

The weight of the finished casting was approximately 114 tons, but to pour it there was provided a total quantity of 135 tons, the excess representing gates, runners and the riser which was cast on the mold as mentioned. In order to have this large quantity of metal ready for pouring at one time, it was necessary to make special provision for storing a large portion of it. This was done by building adjacent to the mold a large reservoir with a capacity of 70 tons, as shown in one of the illustrations. This reservoir was made up of cast-iron rings and properly lined with fire brick and clay to hold the molten metal. In addition there



The Special Core as It Is Being Lowered Into the Mold Is Shown at the Right. While the Pouring of the Casting and the Special Reservoir for Molten Metal Is the Subject of the Large View at the Bottom. The finished ingot mold is also shown



were three ladles of molten metal holding respectively 25, 30 and 10 tons. The 70-ton reservoir was connected to the mold by means of a trough, and at the proper moment the plug at the bottom of the reservoir was withdrawn and the molten metal released and conveyed to the mold through the trough. At the same time the ladles were poured into the mold through other similar runners.

Russian Rolling Stock Sold by Government

WASHINGTON, May 4.—The War Department has sold a considerable number of the Russian type decapod locomotives which were part of an original order placed with American builders by the Imperial Russian Government, and which on the collapse of that Government were taken over by the War Department and put into operation on American railroads to relieve the demand for motive power during the war. A considerable number of box cars and gondola freight cars also have been sold.

The purchaser of the locomotives was the firm of Cuthell, White, Bayles & Appell, Washington, who have bought 113 of the locomotives at \$47,710 each.

The U. S. A. International Corporation, 729 Seventh Avenue, New York, exporter to the Near East, has purchased 7025 box and gondola freight cars, probably for shipment to Esthonia, which recently was granted a concession from the Soviet government of Russia to construct a railroad from Esthonia into Russia. The purchase includes 75 Guerite box cars, 1820 low side gondola freight cars, 3575 high side gondola freight cars (plain) and 1525 high side gondola freight cars (tarpaulin frame).

Iron Industry of China

WASHINGTON, May 11.—A summary of the iron ore resources of China is given by Julean Arnold, who has served as commercial attaché of the Bureau of Foreign and Domestic Commerce in that country for many years, in a commercial handbook of China which has just been issued by the bureau. Mr. Arnold says:

"Dr. H. Foster Bain, assistant director of the United States Bureau of Mines, who spent some time in China investigating its mineral resources, estimates that China has 400,000,000 tons of iron ore available and suitable for modern furnace reaction and an additional 300,000,000 tons that might be treated by native methods. The iron ore deposits are now controlled by Chinese or Japanese interests, the Chinese Government aiming to control those that are not already mortgaged to Japanese interests. The Penchichu furnaces were producing in 1918 about 75,000 tons of pig iron. The Anshanchan Iron Works in Manchuria, operated by the South Manchuria Railway, have an annual output of 150,000 tons. The Han-Yeh-Ping furnaces are probably producing an equal amount, which will be increased when the company's furnaces are in operation at Tayeh. Thus a fair estimate of China's production of pig iron (1918) would seem to be about 500,000 tons a year."

Diplomacy and Commerce

WASHINGTON, May 4.—Legislation defining the duties of the Department of Commerce in the promotion of trade, and drawing a line between its activities and that of the consular agents of the State Department, will be welcomed by Secretary of Commerce J. W. Alexander. The controversy which has steadily been increasing between the two Governmental departments was alluded to by Secretary Alexander in his speech before the annual meeting of the Chamber of Commerce of the United States at Atlantic City. Mr. Alexander suggested that the business men recommend such legislation as they desire for defining, enlarging, improving and co-ordinating diplomatic and commercial activities of the Government.

"I believe that fairly direct and simple legislation could co-ordinate the two, and still leave diplomacy to

Some idea of the crane capacity required for handling castings of this kind can be obtained when it is considered that in addition to the casting, which in itself weighed 135 tons with the riser and gates, there was also the weight of the core that required handling at the same time, and it is therefore probable that the total handling capacity exceeded at least 200 tons.

the diplomat and commerce to the business men's department," said Secretary Alexander. "Any attempt to make commerce a diplomatic function is extremely dangerous."

Steel Industry of Nova Scotia

WASHINGTON, May 4.—Greater demand and increased prices characterize the present situation in the iron and steel industry in Nova Scotia, according to a report forwarded by Consul Charles M. Freeman, from Halifax.

"The steel industries during the past three months show a very favorable improvement, the tendency being an upward trend over last year's output," says Mr. Freeman. "This has been made possible by a greater demand for rods, billets and wire products in the British market and a demand in the United States for wire nails and light rails. This year's products of the Dominion Steel Co. will contain the new item of ship and boiler plates, which are now being rolled at the company's rolling mill."

Australian Tariff Changes

WASHINGTON, May 11.—General increases in Australian import duties on iron and steel commodities are provided in the new tariff which recently went into effect provisionally in that country. The measure is subject to later change. The new tariff is in many respects far more protective than its predecessor.

A number of executives identified with the iron and steel industry in the Mahoning Valley have been added to the board of directors of the National Refrigerating Co. at Youngstown, Ohio, among them W. H. Warren, formerly general manager of the Brier Hill Steel Co.; John N. Reese, first assistant to the second vice-president of the Republic Iron & Steel Co.; Fred R. Kanengeiser, vice-president and general manager Bessemer Limestone Co., and Isaac Wilkoff, secretary the Wilkoff Co. Other directors are Henry F. Kaercher, who is also president of the concern; Charles Smythe, secretary and treasurer; F. W. Perry, vice-president; Samuel A. Dalzell and Arthur Geisler, who is also chief engineer. Mr. Geisler was formerly chief engineer for the Platte Iron Works. The company has completely equipped the old plant of the F. W. Perry Machine Co. with new and modern machinery adaptable to the manufacture of its low pressure refrigerating machine. It has a capacity for 3000 commercial units per year. To provide working capital and to finance expansions the company recently increased its capital stock.

The Pure Oil Co., Division the Ohio Cities Gas Co. of Columbus, held a business convention at the Waldorf-Astoria Hotel in New York, beginning April 30, under the direction of S. M. Coen, general manager of the distributing division of the company. Friday evening was devoted to a banquet, at which addresses were made by A. F. Sheldon, president Sheldon School, Chicago; C. A. Ward, president Dayton Gas Co.; John Edwards, vice-president Moore Oil Co., Cincinnati; and Arthur M. Crumrine, president Arthur M. Crumrine Co., Columbus. Saturday morning was given up to a tour of inspection of the company's plants in Brooklyn, followed by a trip on the company's ocean tanker No. 3 to the storage plant of the Ohio Cities Gas Co. at Kearney, N. J., where gasoline was supplied to the allied armies during the war. The final business sessions were held Monday.

Taylor Society Meets in Rochester

Scientific Management Body Joins with Chamber of Commerce to Plan Wider Application of F. W. Taylor's Principles

THE Taylor Society, devoted to scientific management, met in Rochester, N. Y., May 6, 7 and 8, under the auspices of the industrial management council and the manufacturers' council of the Rochester Chamber of Commerce. Steps were taken for the formulation of an industrial dictionary of terms common to all industries run upon modern plans to avoid existing confusion because of different meanings attached to those terms; steps were also taken for putting out standard blanks and forms, organization charts, standard practices. Emphasis was placed on the fact that the Taylor system is applicable—not only to the production end of industry—but to administration, finance, sales, etc.

There was a registration of 300. Many lines of industry were represented, several of them being metal-working lines. The largest representation from any one company was the delegation of twelve from the Erie Forge & Steel Co., Erie, Pa. Since the clothing industry is the most prominent in Rochester, as stated by Henry T. Noyes, general manager Art in Buttons, Inc., Rochester, it was natural that that industry was well represented. Many students were present from Mechanics Institute, Rochester.

Thursday evening was devoted to a reception at the Rochester Club, Friday forenoon to papers and discussions; Friday afternoon to visits to the plants of Art in Buttons, Inc., and L. Adler & Bros., clothing manufacturers; papers and discussions occupied Friday evening and Saturday forenoon; round table conferences on phases of management were held Saturday afternoon and a joint dinner of the Taylor Society and the Rochester Chamber of Commerce concluded the session. Sessions were held in the University of

Rochester, Powers Hotel and the Chamber of Commerce Building.

Some Advances in Fees

Three changes were made in the constitution: Dues of life membership were placed at \$1,000, payable in four annual installments; dues of sustaining members were placed at from \$100 to \$500; the board of directors was given power to organize local sections. Carl George Barth, consulting engineer, Buffalo, N. Y., was made an honorary member, as announced by Henry S. Dennison, Dennison Mfg. Co., Framingham, Mass. Only two other honorary members have been elected by this society: F. W. Taylor, for whom the society was named; and Henri Le Chatelier, member L'Institut, Paris.

The following were the topics and leaders at the round table conferences: Co-ordination of sales and production, J. C. Heckman, production manager United Drug Co., Boston; scientific methods applied to sales operations, C. G. Morrill, Lakewood Engineering Co., New York; scientific methods applied to office clerical operations, W. H. Leffingwell, Leffingwell-Pearson Co., New York and Chicago, consulting engineer; planning, A. B. Rich, Dennison Mfg. Co.; routing and control of work in process, W. D. Hemmerly, resident engineer Thompson & Lichtner Co., Boston and New York; standards of performance (including time study), Sanford E. Thompson, Thompson & Lichtner Co.; standards of materials, equipment and operations, C. G. Barth, consulting engineer, Buffalo, N. Y.; instruction cards, Morris L. Cooke, consulting engineer, Philadelphia; the daily labor inventory, Joseph A. Carlin, Joseph & Feiss Co., Cleveland.

To Standardize Terms, Executive Titles, Wage Policies

THE most discussed paper was that of William O. Lichtner, Thompson & Lichtner Co., on "The Promulgation of Standards by the Taylor Society," of which the following is an abstract:

At this period in the growth of the society the most important work is the determination and promulgation of standards. The knowledge and experience of members has already resulted in the establishment of standards in individual plants. The movement now in my mind consists in the systematic pooling of this knowledge and experience to make it available to every member of the society, now and for all time. The following are the main heads under which organized effort or such promulgation should be treated:

1. Standard terms.
2. Functions and executive titles of a standard organization.
3. Policy of bonus payments.
4. Policy of base rates and total earnings.
5. List of books for reference in industrial management.

A great many of the terms used in the industrial world are not in our dictionaries, or when they are, they are defined only in a very general way. This lack of any source for finding the real meaning and significance of industrial terms is a decided hindrance to a mutual understanding among industrial people because it makes it impossible for them to be sure that the same term means the same thing. It seems worth while to define a few common terms as a start toward an industrial dictionary. In case of terms which have been used almost universally, even though erroneous, it is best not to try to change them. Such a term is "schedule," which is an order upon the factory to manufacture a

definite amount of goods of a definite kind. Where the constant changing of terms has brought the organization to a point of confusion and irritation, judgment must rule against the advisability of still other changes. However, a change from the term, "tickler" to the term, "reminder" will be accepted and adopted very readily because the latter is much more significant.

There are two possible plans for procedure: To have all plants under Taylor management change their terminology to conform with the Taylor standards; to have individual plants retain all their established terms so as not to irritate the members of an organization. Though the first plan is more ideal, probably the best is to combine the two, introducing the terminology conforming with the Taylor standards wherever practicable.

Nucleus for Industrial Dictionary Proposed

The speaker then gave about 100 common terms suggesting appropriate definitions and defending some of them which varied from the popular conception. For instance, what has been called "gang ticket" he would designate as a "group ticket" because of the repugnance of skilled workmen to be called members of a "gang." He would define it as: "A double ticket 8½ in. x 4½ in. to be folded in the middle so as to correspond in use and filing with a 4¼ in. x 4¼ in. time ticket, printed in black ink on manila paper. The folded portion of the ticket is used for recording the employees' numbers and time going off and on to the work when necessary to shift them."

There is often confusion between the terms "bulletin board" and "planning board," so the speaker made the following distinction: "Bulletin board—a board

placed in the office and various stations in a factory for posting all kinds of notices and bulletins for the attention of all the employees; planning board—a board maintained in the planning department, built in sections $60\frac{1}{2} \times 60\frac{1}{2}$ in., each section containing 120 sets of hooks corresponding to the machines, work places or employees in the plant. Tickets are hung on the hooks in the same order as the jobs appear on the running list." The speaker prefers the term "employee" to workman, hand, etc.; also "factory" in place of "mill," "plant," "shop."

In many organizations the functions of the members have been so poorly defined that when something goes wrong, each one can pass the buck on to the next one. In other cases the organization may have some weak sisters holding down big jobs who would have to be given subordinate positions if an organization chart was drawn up. In one concern there were so many vice-presidents to be given jobs, all of them on an equal footing, it was soon decided never to exhibit the organization chart.

The speaker then showed a typical chart which first divided the organization into four major functions called "divisions." This all functions under one head, the general manager, the latter term replacing what is sometimes termed the "works manager" or "plant manager." The titles of the men controlling the divisions are: Financial, treasurer; secretarial, secretary; sales, manager of sales; manufacturing, manager of manufacturing. It is bad practice to give a high sounding title to a man instead of raising his salary, especially if his position and value does not warrant such a title.

Every company should formulate a definite policy as to the principles on which it bases the payment of its employees. There often results ill feeling between employers and employees which could have been prevented had the management clearly formulated their policy in writing.

Should Determine Base Rates and Bonuses

The Taylor Society should come together in planning how to determine what a fair day's pay should be, this being the base rate. An additional compensation should be paid the employee over and above the base rate provided his work is of the required quality and quantity. A bonus should not be paid in place of wages. The base rate should be the average rate paid in similar industries in the particular vicinity. The smallest bonus which should be allowed employees is 20 per cent of the amount of the base rate. A bonus should never be referred to as "lost," but as "not allowed," or "not earned." In estimating the amount of earnings of employees when on bonus work, it should be figured that they earn their bonus in 85 per cent of the jobs assigned them. Conditions arise on every job making it impossible to give all the employees bonus work 100 per cent of the time, and even the best workers may not make their bonus 100 per cent of the time.

In conclusion the speaker advocated that the Taylor Society establish an industrial dictionary; establish standard forms and methods of routine; establish a typical organization chart; a reference list of books consistent with the work and principles of the Taylor Society; standards of practice on such items as method of wage and bonus payments and amount and relation of base and bonus rates; that the Taylor Society come to some decision as to where it stands with reference to important points in modern industry.

In the discussion of the paper Mrs. Frank B. Gilbreth, wife of Frank B. Gilbreth, Inc., consulting engineer, Montclair, N. J., said that it takes courage to put down on paper these definite and tangible suggestions for the criticism of those present; that the invention and adoption of auxiliary terms is no mark of disloyalty to F. W. Taylor. H. K. Hathaway, consulting engineer, Philadelphia, suggested the appropriation of funds to carry on the standardization suggested. W. D. Hemmerly stated that the society owes it to future generations to pass down organized data; that it would prove a good medium of reference. He proposed a library in the New York office and suggested the contribution

of \$1 from each member of the society toward that library. Boyd Fisher, consulting engineer, Detroit, contended that the standardization of terminology cannot be done by any one committee or by arbitrary methods. He pointed to the means by which the English language grew—not by the efforts of any one man or group of men. Sanford E. Thompson plead for the turning over of the standardization work to a committee, pointing to the success of other societies in their committee work.

Need for Business Planning

J. William Schulze, of the company of his name of New York, read a paper on "The Necessity of Planning in Administration." He said that planning involved the three questions: What shall be produced, how much, and the cost. Since the size of all business is limited by the production department, production and cost is where all planning starts. Where there is a lack of planning the following may result: Shortage of one commodity or part and surplus of another; cutting of prices to dispose of the surplus; putting on a campaign to create a demand for the surplus product as a substitute for that really desired; hiring of an extra force to rush the product through; working in a night shift.

One plans a house, bridge, tunnel—so why not a business? The more uncertain the outlook the more need for careful planning. How carefully is advertising planned to bring maximum results? How many can justify their sales by carefully prepared statistics? The speaker told of one concern which had to drop from their list of customers either their retailers or jobbers. The decision was made at one meeting of the board of directors without studying the problem. Distribution should be by a preconceived plan and not by influences of the moment, as for instance when one energetic branch sales office will get hold of more goods than its share to the detriment of another office. When the rest of the industrial functions are properly carried out the financing is a mere matter of arithmetic. It is better to keep the profits within a certain limit than all the traffic will bear. The planning of the distribution of profits is very essential, especially in these days of industrial unrest. Profits belong to the investor, worker and the public.

Planning for the future is very important as one of many factors may come like a thunderbolt to destroy the industry if not protected, such as changes affecting labor, political situation, merchant marine, rate of exchange. Von Moltke had plans in his table drawer for many years for the next war with France. Some of the brewers were prepared for July 1 and switched into other businesses without much loss.

M. L. Cooke, in the discussion of the paper, said that profits and financial stability are not the chief desiderata; that industry is of interest to society and not individuals. The term "efficiency" has suffered because it is an all-inclusive term. It has spelled "bunk" in too many lives and lines. Young industrial engineers should not seek at first too many original ideas, but should rather follow closely the Taylor principles. The Taylor Society stands for the maximum of science in industry. Most of our captains of industry spend their time on near-by problems and late-afternoon worries rather than on the facts of the far future.

Horace Drury, special expert with the United States Shipping Board, Washington, D. C., said that as soon as the administration of a business makes plans then it becomes the management. Carl G. Barth defended the Taylor system, claiming that it provides for a task, means of accomplishment and punishment for failure for each member of the factory from the president to the fellow who sweeps the floor.

Methods of Reporting Balance of Work

William D. Hemmerly, resident engineer Thompson & Lichtner Co., Boston and New York, discussed balance of work. The purpose of such a report is to give the power to visualize the work of the entire factory as a whole. Such a report provides for data on ma-

chines, labor and tools. There are three kinds of planning boards: the sorting tray mechanism, the index visible mechanism and the hook type planning board, the last being used at the Tabor Mfg. Co., which is the pioneer company to adopt the Taylor system. By the report track is kept of work being done by a certain machine, employee, or tool; of work assigned to the machine, etc., and ready for operations; and third, of work assigned but not ready. Special provision should be made in the report for special machinery, like planers, which may not be used continually. The four-week period for future planning is the best in the opinion of the speaker.

Discussions of this paper were made by John W. Carter, Tabor Mfg. Co., Philadelphia; Sanford E. Thompson, Thompson & Lichtner Co.; D. J. Walsh, Jr., United Drug Co., Boston; and F. D. White, production manager Eaton, Crane & Pike Co., Pittsfield, Mass., all of whom agreed that Mr. Hemmerly had covered the subject thoroughly.

Factory Lighting

The importance of the lighting arrangements in a factory was emphasized by Ward Harrison, illuminating engineer, Cleveland, and chairman of the committee on reciprocal relations, Illuminating Engineering Society. His talk was illustrated by psychological tests performed on the audience and by lantern slides. He said that sunlight was the best light because of the better diffusion and the absence of glares and shadows. Mr. Harrison showed a chart which demonstrated that while coal, chemicals, metals, labor and lumber had risen in cost since 1909, the cost of lighting had decreased in that period to the same extent that these others had increased. Therefore economy on lighting is a poor economy. The work of night shifts averages from 10 to 25 per cent less than day shifts and this is largely attributed to the poorer lighting.

Exhaustive tests should be made to find how far the candle power can be increased with an attendant increase in efficiency until the peak has been reached and crossed and more illumination brings no more increase in output. On a cloudy day the natural light is equivalent to 1000 foot-candles; on a snowfield with the sun at midday this is increased to 5000 foot-candles and is too much light for human efficiency.

The cost per foot-candle is not over one-tenth of one per cent. of the employees' remuneration. In all efficiency tests in artificial light the highest level of production and economy has been found in light ranging from 10 to 15 foot-candles. Usual tests where better lighting has been installed show an increase in production from 10 to 20 per cent. W. H. Leffingwell, Leffingwell-Ream Co., consulting engineer, New York and Chicago, showed how the lighting in a factory is charted out with squares, the brighter the tints of the squares, the brighter the light in those areas.

Character of Immigration Affects Industry

The industrial problem was discussed at the banquet by Ernest Martin Hopkins, president Dartmouth College, described by the toastmaster as "one of the younger college presidents and a business man president." The following was the substance of his talk: The war has hurried along problems for immediate solution which we could have normally worked out leisurely in the next decade. Science is not a true science unless it is devoted to the good of mankind. If it is not devoted to altruism—well, look at Germany!

In the early history of our nation our citizens fought chiefly to overcome nature. This conquered, there developed conflicts between classes and individuals. Sooner or later we'll go the way of the older nations, with our natural resources scanty. We must henceforth look upon the United States as an inclusive nation, rather than an exclusive one.

From 1909 to 1914 the net immigration into this country was over 4,000,000; from 1914 to 1919 only over 400,000. In 1890 the center of immigration was located at about Antwerp and consisted principally of peoples from Great Britain, France, Scandinavia, Germany, Italy, etc., where they were used to law and order and peaceful living. However, the last census

showed that the center had shifted to about Budapest, or the center of peoples who have known tyrannies, autocracies and no just laws. No attempt has been made to absorb this latter group until recent months.

We can no longer operate on the old theory of absolutism. Co-operation and mutualism must be recognized more than ever before. It is a wrong doctrine, however, that there is to be one grand level—that is Socialism. This is the time for bringing out more self-expression from the workman. Production has never been increased by law or evangelistic oratory, but by making the tools of industry more effective. However, we have reached the limit of that procedure. Now our program must go hand in hand with the development of the worker.

We can never get rid of the movement for more pay and shorter hours until the work has been made more attractive to the worker. The speaker once asked a man drilling holes in a steel plate what the finished piece was to be used for. He did not know. Neither did his fellows. The modern way is to take the employees through the entire plant, the same as visitors are conducted through, so that each sees his work as related to the entire process. Costs should be explained. The lack of an opportunity for self-expression for the workman makes that workman express himself outside the plant—often in a way uncomplimentary to the management.

Those Present

Among those present from metal-working and allied industries were the following:

George C. Argy, manager industrial information department, the Lamson Co., Boston; Willard P. Barrows, counselor in management, Philadelphia; A. C. Jackson, works manager, Miller Lock Co., Philadelphia; George L. Bell, consultant in industrial relations, San Francisco; Howard G. Benedict, consulting engineer, Scott & Feber Co., Cleveland; Ralph Bowman, assistant manager in charge of administration, supply and sales, United States Emergency Fleet Corporation, Washington, D. C.; Howard Breed, the Crane & Breed Mfg. Co., Cincinnati; Robert W. Bruere, director Bureau of Industrial Research, New York; Raymond F. Bryant, superintendent productive efficiency Yale & Towne Mfg. Co., Stamford, Conn.; Raymond S. Chase, factory accountant General Railway Signal Co., Rochester, N. Y.; Craig Devine, Erie Forge & Steel Co., Erie, Pa.; H. D. Du Mars, Erie Forge & Steel Co., Erie, Pa.; H. B. Drury, special expert United States Shipping Board; Dwight T. Farnham, consulting engineer, St. Louis, Mo.; Boyd Fisher, consulting engineer, Detroit; William J. Flynn, assistant to the president Erie Forge & Steel Co., Erie, Pa.; William J. Franklin, auditor Erie Forge & Steel Co., Erie, Pa.; C. T. Fuller, production manager Watson Products Corporation, Canastota, N. Y.

F. L. Gayton, organization planning staff, Pierce Arrow Motor Co., Buffalo, N. Y.; Frank B. Gilbreth, consulting engineer, Montclair, N. J.; J. C. Gillespie, foreman Erie Forge & Steel Co., Erie, Pa.; Mack Gordon, industrial consultant, Cleveland; Arthur Brooks Green, Erie Forge & Steel Co., Erie, Pa.; E. A. Hauser, Thompson & Lichtner Co., Boston; Walter M. Ladd, Pierce Arrow Motor Car Co., Buffalo, N. Y.; C. P. MacArthur, King Sewing Machine Co., Buffalo, N. Y.; F. J. McCarthy, production manager Erie Forge & Steel Co., Erie, Pa.; G. R. McGloucy, superintendent Erie Forge & Steel Co., Erie, Pa.

F. T. Mack, Sperry Gyroscope Co., Brooklyn, N. Y.; E. R. Millar, comptroller Lycoming Motors Corporation, Williamsport, Pa.; C. G. Morrill, sales engineer Lakewood Engineering Co., New York; Robert E. Naumburg, mechanical engineer J. William Schulze & Co., New York; Harry L. Olmstead, manager production Yale & Towne Mfg. Co., Stamford, Conn.; M. E. Ream, vice-president Leffingwell-Ream Co., Chicago; Carlton R. Sabin, Lakewood Engineering Co., Cleveland; Herbert G. Sharp, assistant production engineer Pierce Arrow Motor Car Co., Buffalo, N. Y.; A. Thelmann, Pierce Arrow Motor Car Co., Buffalo, N. Y.; G. W. J. Stout, general superintendent Erie Forge & Steel Co., Erie, Pa.; Harry K. Strickler, assistant chief engineer Erie Forge & Steel Co., Erie, Pa.; L. S. Tyler, vice-president Acme Wire Co., New Haven, Conn.; C. F. Uhler, production manager Erie Forge & Steel Co., Erie, Pa.; C. L. White, assistant engineer of organization planning, Pierce Arrow Motor Car Co., Buffalo, N. Y.

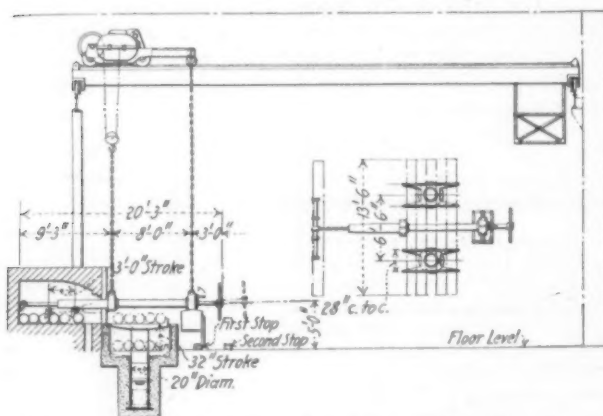
The American Boiler Manufacturers' Association will hold its thirty-second annual convention at French Lick Springs Hotel, French Lick, Indiana, May 31 and June 1 and 2.

Pipe Charging Machine

A horizontal single-hoist pipe charging machine designed to reduce the labor required for handling to and from the annealing furnace, and rolling within it, the pipes used in the annealing of tool steel, has been developed by Edgar E. Brosius, contracting engineer, Pittsburgh.

The machine is operated by a standard overhead crane (minimum capacity 5 tons) by providing a small trailer attachment for supporting the rear end of the charging bar. Where an overhead crane is serving the furnaces, the additional equipment required consists of the trailer attachment, the supporting chains and the machine itself. In operation two men are required, one with the machine and a crane operator.

In rolling over the pipes to insure uniform heating while in the furnace only two settings of the machine are necessary. With the first setting the first two pipes in the furnace are rolled forward, one at a time, through 180 deg., and with the second setting the remaining three pipes are rolled forward through 180 deg. The stroke of the rake is made to suit the



Crane Operated Charging Machine for Handling Pipes Inside and Outside the Annealing Furnace

number and size of pipes to be rolled, and its movement back and forth is accomplished through a threaded rod and sleeve, the turning of the hand wheel revolving the sleeve.

When removing the pipes from the furnace the hand wheel is not moved, but each pipe is rolled all the way out and upon the elevating tables by the crane trolley which travels along the bridge until the pipe reaches the desired position on the table. When the tables are fully loaded they are lowered into the pit, covered over, and the pipes with their contents allowed to cool. A new charge of full pipes is then placed on top of the cover and rolled into the furnace. By the time this charge is annealed the pipes under the cover have cooled and have been removed and the elevating tables raised to receive the second charge of pipes, in this way making the operation of the annealing furnace continuous.

Each elevating table consists of a steel casting mounted on the plunger of an air cylinder.

Preparatory to charging the furnace, the pipes are placed on the elevating tables (in the elevated position) or on the cover by the crane. When charging they are rolled, one at a time, from the tables or cover into the furnace by running the trolley along the bridge, each pipe being pushed the full distance by the rake.

In case it is desired to use the crane for purposes other than charging, the machine is lowered upon the floor and the chains slipped off the crane hooks, leaving the crane free for general work.

The American Bronze Corporation, Berwyn, Pa., manufacturer of Non-Gran bearing bronze, is not connected with any other company manufacturing bearing bronze. This announcement is requested to prevent confusion with a company of identical name incorporated in another State, against which, according to a newspaper item, a petition in bankruptcy has been filed.

Electric Rivet Heaters

Electric rivet heaters, designed and perfected by the American Car & Foundry Co., New York, during the past six years, to improve working conditions in its own shops, are now being marketed by this company under the trade name "Berwick," in eleven standard sizes with two to five electrodes or more, for rivets of various sizes up to 1½ in. by 10 in. or larger. The capacity of the heater depends upon the size of rivet and type of heater, varying from 75 to 600 hot rivets per hour.

The use of less than maximum capacity, it is stated, does not increase the cost of heating; single rivets can be heated on a five-electrode heater with the same current consumption per rivet as though the heater were running at full capacity. The manufacturer states that the use of the heater reduces burning and scaling spoilage to ½ of 1 per cent, also the cost runs between 20 and 30 cents per 100 lb. of rivets heated.

It is explained that by eliminating smoke and gas, and the discomfort of excessive heat in summer, the electric heater increases both quantity and quality of production, and also eliminates dirt and droppings. From 20 to 30 seconds after a rivet is placed between the electrodes, it is stated to be heated sufficiently for use. The heater is portable. The larger sizes are provided with chain hoists for moving about by crane, and some of the smaller sizes can be furnished on wheels for convenience in moving from place to place.

Upright Drilling Machine for Medium Weight Work

John E. Snyder & Son, Worcester, Mass., have begun the manufacture of a type of drilling machine new to their line, known as 24-in. adjustable head upright drilling machine, designed especially for medium weight work. It is built either for belt or motor drive, the latter either belt or gear connected. A tapping attachment and compound table can be furnished.

The machine drills to the center of a 24-in. circle. The maximum distance from spindle to base is 41 in. and from spindle to table 10 in. The automatic feed of the spindle is 17½ in., vertical traverse of head on column 17 in., and of table on column 21 in. The spindle has an automatic gear feed of 10 in. The base dimensions are 4 in. deep, 22½ in. wide, and 47 in. long. The diameter of the spindle in the sleeve is 1½ in., hole in spindle No. 4 Morse taper, spindle sleeve diameter 2½ in., and spindle nose diameter 2 in.

In this type of machine the power feed is driven from the top shaft instead of from the main spindle, the purpose being to maintain more permanently the alignment of the main spindle.

Standardizing Cleaning Cloths

The production of cleaning cloths on a basis of uniform quality and complete standardization of all the other factors entering into the product is the latest venture of the Royal Mfg. Co., Rahway, N. J., makers of cotton and wool waste. Standardization in this field, this manufacturer states, must begin with the raw material, which in the past has shown a tendency to diverge widely as to uniformity of quality and origin. The cloths will be made from materials procured from standard sources selected for the required quality and kind of cloths they produce, and will be laundered and dried before shipment, and guaranteed completely sterilized. Through standard processes and equipment the finished article will be warranted to run true to sample.

Shipments will be made in bales of light clean bur-lap with steel bands, the weight to be guaranteed even as ordered, thus to obviate the "padding" evil. "Tare" (wrappings) are not to exceed 6 per cent of the total weight. The cloths are to be made in four standard grades, all white, colored, near white and hosiery, and may be ordered from a sampling card.

Processes employed by this company in the manufacture of standardized cotton waste were described in THE IRON AGE, issue of June 27, 1918.

Detroit Labor Situation Is Improving

Many Plants Resume in Part and Number of
Unemployed Is Reduced—Cincinnati Strike De-
velopments—Still Much Trouble at Youngstown

DETROIT, May 10.—Strikes, material shortages and fuel shortage have all played their part in the Detroit labor situation. At the end of the week, however, conditions appeared to be almost back to normal.

The trouble started, of course, with the switchmen's strike, which virtually paralyzed transportation in and out of the city. Other strikes in the city, and throughout the State for that matter, have been comparatively unimportant. In fact, while the building trades are pretty thoroughly tied up by strikes, with the result that almost all construction jobs, large and small, are at a standstill through agreement between the owners and contractors, the total number of strikers is only about 5000, and the situation is not looked upon by members of the Builders' and Traders' Exchange as being alarming. Other strikes, with the exception of the switchmen's strike, are virtually nonexistent on any large scale.

The tie-up of the railroads resulted almost immediately in a shortage of fuel, which caused the Detroit-Edison Co., three weeks ago, to place strict limits on the amount of power for each manufacturing concern. Then came the shortages in raw materials. This resulted in a few shutdowns of factories and all plants going on three-quarter time operation. Two weeks ago there were about 130,000 of the 385,000 industrial workers in Detroit who were unemployed. A week later this unemployment had been reduced to about 60,000. At the end of the past week, this number had been further reduced to a total of about 35,000, according to most estimates.

The normal number of unemployed workers in Detroit is estimated at about 15,000. About 5000 more are out on strike. This left about 15,000 to be accounted for. These are men forced out by shutdowns. Of course, all plants, virtually, are still operating on reduced hour scale, because of material shortages. In this respect, however, things are beginning to look much more encouraging. Pooling of shipments, with the plants furnishing their own engine and train crews, has helped considerably in cases where the railroads had diverted all their men into the work left by the striking switchmen and by other employees who had left for other employment. It is generally believed that, while conditions of congestion in Detroit are still serious, they are in a fair way to be rectified, and that shortly some semblance of normal service, at least normal for these times, will be obtained.

The reduction of production, owing to material shortages, enabled the Detroit-Edison Co. to get ahead again on its fuel supply, and the lack of outgoing shipments of finished products, to some extent, enabled the railroads to make way for new shipments of raw materials into the city. This, in conjunction with the betterment of railroad conditions, makes it seem probable that very shortly employment conditions will be entirely normal and the plants will go back to full time production.

Valley Mills Still Badly Crippled

YOUNGSTOWN, OHIO, May 11.—Valley producers are still struggling against operating difficulties imposed by the prolonged strike of railroad yardmen and switchmen, in an effort to keep their plants active. By shipping in solid trainloads a large tonnage of finished product has been cleared, though warehouses and shipping wharves are still clogged with product. One maker was enabled to ship several thousand tons of sheets last week in train lots. Principal trunk lines are continuing their determined efforts to build up their operating organizations, the Erie and Pittsburgh & Lake Erie annulling seniority rights of the insur-

gents. Fuel shipments have improved and all Valley plants started the week with better schedules than at any time in the past month.

Through freight service is being maintained by the chief carriers, but switching is still spasmodic and irregular, most of it being performed by volunteer or newly assembled crews. Financial circles place the wage loss to workers in the district at \$150,000 daily, while the loss to the industries will run into the millions.

Sheet output is enhanced this week, with operation of the hot mills at Haselton of the Sharon Steel Hoop Co., which were idle for over three weeks. Trumbull Steel Co. started three of its seven open-hearth furnaces at Warren, and is operating its strip mills. Its tin and sheet mills are producing at the rate of 40 per cent. Its Liberty tin plant is still idle.

The Youngstown Sheet & Tube Co. continues two blast furnaces active, two batteries of by-product coke ovens, blooming mill, and finishing units less than 40 per cent of normal. The Republic Iron & Steel Co. will operate its plate mill this week, as well as two blast furnaces at the Haselton group, 13 open hearth furnaces and a number of finishing units. Its DeForest sheet works is in partial production.

The A. M. Byers Co. will maintain curtailed schedules at its Girard plant until the transportation situation improves. This week 44 puddling furnaces working three shifts are in operation, the blast furnace and both skelp mills being idle.

Carnegie Helped by Fuel Supply

As usual, the Carnegie Steel Co. seems to have a better regulated fuel supply than the independents and has a larger blast furnace schedule, four stacks at the Ohio Works pouring. Twelve of 15 open hearths are melting, while two Bessemer converters, the blooming mill and several bar mills are active. The McDonald merchant bar mills are operating to normal capacity, while the Upper and Lower Union mills are producing about one-third.

The Brier Hill Steel Co. is maintaining well sustained schedules, in view of the disorganization of transportation. It has one blast furnace active, half of its open-hearth department, its by-product coke plant on a reduced basis, the 84-in. plate mill, and 20 sheet mills, the Western Reserve works at Warren being idle because of lack of steel.

The Newton Steel Co. was compelled last week to suspend its four active sheet mills at Newton Falls. The Falcon Steel Co. is operating eight mills on a reduced basis, last week putting its new jobbing mill on a production basis for the first time.

It is significant that the Brown-Bonnell finishing mills of the Republic company, which have been without steam for four weeks, have been idle for a longer consecutive period than during the steel strike last fall and the interruption to production has been proportionately more serious.

In the Shenango Valley, the Carnegie Steel Co. has been forced to close its Sharon plant. Last week the American Sheet & Tin Plate Co. operated 30 hot mills at the Farrell works and eight at the Mercer plant.

The Wage Conference

Sheet makers are not expecting any interference with operations in their mills due to the wage conference with employees. There is a strong disposition among manufacturers to resist any suggested advances in the base rate because of the prevailing high wages paid in this branch of the industry and because of the growing feeling that the tide of prices, if not wages, is turning downward. Employees are now formulating

their wage demands at the annual convention of the Amalgamated Association of Iron, Steel and Tin Workers, in session at Scranton, Pa. Manufacturers do not believe the men will press any demand for an advance in the base, but will be willing to abide by the agreement with respect to wages which became operative July 1 last, effective for one year from date. Boss rollers are earning, even at reduced turns, between \$500 and \$600 per month. Last year several rollers in this territory earned between \$7,000 and \$8,000, while two years ago one such employee of a district maker was paid in excess of \$10,000 for a year's work. In the face of such disbursements, manufacturers are a unit in opposing any advances in base, as suggested by a number of lodges affiliated with the Amalgamated.

Sheet production in the district during the past two weeks has been somewhat less than 45 per cent of normal. The price of one-pass black is not so firm as two weeks ago, some buyers declining to order at 10.50c., and indicating that they might be interested at a price of 8.50c. or possibly 9c. There has been an easing-up in plate demand and a heavy reduction in output due to the strike. Sheet bars are being routed to consumers in this territory in trains of 12 to 15 cars and shipments have been fairly satisfactory and adequate. Makers' schedules are well backed into the third quarter, with price of open-hearth bars spreading between \$70 and \$80. Wrought iron and steel pipe production is reduced to a low ebb. Wherever possible, product is being shipped to consumer by truck, and this practice is general within a 100-mile radius.

Novel Methods Used

DETROIT, May 10.—A notable example of the kind of resourcefulness and determination that goes far toward defeating the plans of radical labor was given recently during the switchmen's strike by the Trumbull Steel Co., Warren, Ohio, when that concern brought the first consolidated trainload of steel into Michigan, thereby helping a number of plants to continue operation in spite of the virtual stoppage of transportation service. The loading was sheet and strip steel for automobile work.

The Trumbull company had orders for 34 carloads for Detroit, four for Ypsilanti, Mich., three for Flint, Mich., and five for Walkerville, Ont., which is across the river from Detroit. Instead of considering priorities or being content with small shipments, the traffic manager of the steel company decided to send as many shipments through as possible by pooling consignments for the different plants.

He obtained 46 box cars, loaded them with steel and sent them on their way. The 46 cars in one train left Warren, Ohio, at 5 o'clock Saturday afternoon, April 24, routed via the Erie, Wheeling & Lake Erie and Michigan Central, and arrived in Detroit at 2 o'clock Monday afternoon. A second train of 34 cars was next sent, reaching Detroit in an equally short time. Thus the company was enabled to send 80 cars of steel in spite of the strike.

Warren, Ohio, is in the Mahoning Valley district, where there are numerous large steel plants. Complete failure of the transportation system would shut off this source of supply, whence comes a large part of steel and steel products used by Detroit automobile manufacturers. Therefore, by pooling shipments and making the greatest possible use of available facilities, the Trumbull company showed the way to aid materially in staving off industrial paralysis in such emergencies.

Similar pooling has been practiced by several large Michigan industries, particularly the Ford, Dodge Brothers and Hudson plants and the Advance-Rumely plant in Battle Creek, Mich. These industries, having their own engines and crews, have experienced little difficulty in handling over the railroads comparatively large amounts of freight. In some cases, plants not having their own engines rented them from the railroads and supplied their own crews, thus doing work that the railroads could not do.

The Ford Motor Co., having fairly abundant private railroad facilities, has been moving trains of 100

cars and more on occasion, and often has picked up cars of coal along and brought them into Detroit for other companies, thus aiding somewhat in the fuel situation.

Cincinnati Strike Drags

CINCINNATI, May 11.—The machinists' strike entered upon its third week yesterday, and to this time 65 shops are affected, about 5200 men being out. Of the shops affected about 25 per cent are closed temporarily, while the remainder are running with about 60 per cent of their force at work. One of the larger shops, at which a strike was declared last week, and which had about 30 per cent of the force out, reopened yesterday morning with a number of those who had left last week back in their places. The big plants in the Oakley colony are still unaffected, and despite the demonstrations of strikers, are operating with full forces. It is reported that dissatisfaction with the manner in which the strike is being conducted is beginning to be felt among the strikers, and officials of the metal working plants are predicting the early collapse of the walkout.

Up to date, with the exception of one small shop, not one of the big machine tool plants in the Oakley colony has been affected, and the attendance since the strike was declared has been even above the average. It is reported that some dissatisfaction exists among the rank and file over the way the strike is being conducted, they being assured that employers would soon be brought to terms. On the face of things, it would appear that the strike would be a failure, as many of the shops employing union men, which have not acceded to the demands presented, are still operating with full staffs. This situation is almost incomprehensible to the strikers, who were told that 99 per cent of the union machinists had voted in favor of a strike on May 1, and they are beginning to wonder when those now employed will leave their posts. The strike is being conducted in a very orderly manner, and no trouble of any kind is expected. It is reported that foundry employees, who are likely to be affected should the strike continue for any time, are absolutely opposed to the strike, and will endeavor to induce the men to return to work, and adopt other means to gain their demands. In the meantime, the employers stand firm in refusing to grant the demands for increased wages, and report that while the temporary setback will have the effect of delaying still further deliveries on orders which are now some weeks behind, they are receiving every encouragement from their customers to see the thing through to the finish.

"A Relic of the Dark Ages"

Frederick W. Mansfield, thrice Democratic gubernatorial candidate in Massachusetts, and for many years counsel, state branch, A. F. of L., at a recent organized labor meeting in Milford, Mass., in plain language took to task those employees who break contracts made with employers. He said in part:

"In former days the employer was able to dictate whatever terms of employment suited him, and the worker was forced to accept them. Now, when the worker finds himself in a position of power because of combination, the worker in turn is endeavoring to get all he can from the employer. Labor unions, to be successful, must be honest, honorable in intention, their objects lawful and praiseworthy, and above all they must regain public respect and confidence. One can't deny that unions in the last few years have lost caste."

Strikes, he said, are "a relic of the Dark Ages, cause untold suffering to the strikers and tremendous loss to employers. The remedy for unrest is not to strike, but to get together and work. While I do not say that strikes ought to be forbidden by law, I do say that the unions themselves ought to make such a law unnecessary by voluntarily agreeing to arbitrate all disputes, in all cases where the public would be seriously inconvenienced if service were stopped." Mr. Mansfield called on his hearers to produce more as the quickest cure for high prices.

Retarded Coke Shipments

UNIONTOWN, Pa., May 11.—The transportation situation as pertains to coal and coke shipments from the Connellsville region again has assumed a critical stage, a reflection of the recent railroad strike. As men in the yards began to return to work there was a heavy placement of empties to the region's operations, but now that this "back-wash" of empties from yards, sidings and terminals in the immediate region has been cleared, placements for the last week have dropped sharply, with indications that the end is not yet. From 70 per cent placement of coke cars a week ago, placements this week averaged but 50 per cent. Coal car placements of 25 to 30 per cent a week ago have dropped to 15 per cent.

The Pittsburgh & Lake Erie in this region still is tied up as a result of the strike, the Newell yards being closed. The company, however, is making an effort to relieve the situation and has issued an ultimatum to the employees to return or forfeit seniority rights.

The coal and coke market is a day to day trading, the consumer assuming all risks of deliveries. Consequently the market is inactive.

In the Field of Labor

Wage payments for the last half of April by steel producers in the Mahoning Valley, which were completed May 10, show that the railroad strike has reduced wage disbursements fully 50 per cent. For instance, the Youngstown Sheet & Tube Co. distributed to its employees for the last half of April \$400,000, as compared with \$1,000,000, the sum usually disbursed on a semi-monthly holiday.

The American Steel & Wire Co., Waukegan, Ill., has evolved a plan to enable its employees to own their homes. All workers in good standing will be loaned sufficient money at 5 per cent interest to build a house. They will repay the loans on the installment plan.

To erect dwellings for industrial workers at Niles, Ohio, the Niles Housing Co. has been incorporated by Lloyd Booth, president of the Falcon Steel Co., and A. J. Bentley, manufacturer. The company is planning house construction on an extensive scale.

Carpenters and joiners at the shipyards of the New York Shipbuilding Co., Camden, N. J., and Pusey & Jones, Gloucester City, N. J., totaling about 759 men, declared a strike, May 1, with demand for increased wages. The men have been receiving 80c. an hour, and ask for \$1.25, with five-day week. A number of departments at the yards have been forced to curtail operations on account of the strike.

Machinists at Hamilton, Ont., have made a demand for a wage scale of 90c. an hour, and 44-hr. week. The present wage rate varies from 60 to 75 cents an hour.

About 300 molders and coremakers at the plants of the Woonsocket Machine & Press Co., the Fairmount Foundry, and the Charlotte Brothers' Foundry, Woonsocket, R. I., declared a strike, May 4, with demand for wage rate of 90c. an hour and the abolishing of piece and premium work.

Three hundred moulders and coremakers employed by the Woonsocket Machine & Press Co., the Fairmount Foundry and the Charlotte Bros. Foundry, all of Woonsocket, R. I., struck on May 4 for 90c. per hr., an 8-hr. day and the abolition of piece and premium work.

A small number of employees at the General Electric Co., Lynn, Mass., recently walked out in protest against the time-keeping system inaugurated by the company. A large number of the employees, however, are in favor of the system. The system is being used to make a scientific study of the time it takes to perform certain tasks, in order that wages and selling prices of products may be determined accurately.

The Rockaway Rolling Mills, Rockaway, N. J., has advanced the wages of laborers at the plant 15c per day, making a rate of \$4.80 per 10-hr. day.

The Champion Blower & Forge Co., Lancaster, Pa.,

has made a voluntary advance of 10 per cent in wages at its plant, with reduction of working day from 10 to 9½ hr., with 10 hr.-pay.

The Worth Brothers Steel Co., Claymont, Del., has arranged for a housing development totaling 72 houses for employees at the works. The project will cost about \$300,000.

The Bethlehem Steel Co., Sparrows Point, Baltimore, has completed plans for the erection of 100 two-story houses in the vicinity of its works for employees.

The Decline in German Copper Prices

On April 7 the German Electrolytic Copper Association reduced the price to 31,880m. per ton, a fall of about 1000m. The following table shows the course of the prices of electrolytic copper in Germany since the beginning of this year, in marks per ton:

Jan. 1.....	24,640	March 9.....	39,520
Jan. 15.....	34,500	March 12.....	33,430
Jan. 31.....	38,150	March 26.....	33,080
Feb. 6.....	43,720	March 30.....	32,860
Feb. 17.....	46,250	April 7.....	31,880
Feb. 24.....	44,060		

The price of copper, as of most other metals, depends largely upon the rate of exchange as, with the exception of spelter and lead, practically all non-ferrous metals are imported. Hence the laying up of stocks is a speculative business at the present time, and many firms have lost millions of marks.

French Customs Duties on Steel

Owing to the depreciation of the franc, the conventional price limit fixed by the French Customs as a basis of discrimination between common steels and crucible steels for the purposes of customs classification has become untenable, because the common steels, on account of their present market values in France, have fallen within the classification which should properly be applied to fine steels, says the *London Ironmonger*. As a result of representations made by the British Chamber of Commerce in Paris, the French Customs have now decided that the value to be taken for the basis of demarcation between common steels and refined tool steels is not only the purchase value as established by the invoices produced, plus the expenses incurred after the purchase, but the market value of the steel at the time when it is cleared through the customs.

French Non-Ferrous Metal Prices

The following official French metal prices, as published in the *Metal World*, April 8, show the marked increase in present prices over those of a year ago. The table gives prices in francs per 100 kilograms as follows:

	Present Price	Same Week in 1919
Copper, ingots for brass making..	702.75	244.75
Copper cathodes	702.75	244.75
Tin, Straits	2124.50	730.00
Tin, English	2103.50	680.00
Zinc, G. O. B.	314.00	115.00
Zinc, high grade.....	327.50	128.00
Lead	295.00	.....
Aluminum	890.00	.....

In most cases these prices are delivered, Havre or Rouen.

The Pretoria Iron Mines and the Union Steel Corporation, Ltd., have been amalgamated under the name of the Iron and Steel Corporation of South Africa, Ltd. The capital of £1,500,000, it is reported, will be supplied by the Central Mining Investment Corporation, co-operating with the National Industrial Corporation of South Africa.

Mr. Hughes, Prime Minister of Australia, recently declared, says the *London Ironmonger*, that before very long Australia would be shipping pig iron to Britain and landing it there at a lower price than it can be produced by British works.

Precision Leveling Instruments

Levels for accurately determining horizontal or vertical planes and for measuring angles are a product of the Rieker Instrument Co., 1919 Fairmount Avenue, Philadelphia. They are for use in the installation, manufacture and maintenance of machine tools, turbines, boilers, generators, etc.

The level vial is ground on its inner surface so that when a plane is out of level 1/1000 in. per ft., it deflects the air space 1/10 in. on the graduation of the level vial; thus if a 12-in. level is placed on a surface and the level bubble is out one graduation, the plane is out of level 1/1000 in. in one foot. Levels are also made in which the air bubble is deflected 3/10 in. when out of level 1/1000 in., or to a greater degree of sensitiveness if desired.

The level is mounted in a planed and scraped iron case with brass top and is adjustable laterally and vertically. The levels are put through a special heat treatment and aged to remove strains, thus to eliminate warping after the iron bases have been scraped.

The accompanying illustrations show different



types of instruments made for leveling shafting and turbines, for the machinist, for squaring up planer ways and vertical surfaces, and a precision leveling instrument for use as a standard. The machinist level is made in lengths of 10, 12, 18 and 24 in.; shafting and turbine levels, 6 and 12 in.; planer level, 12 and 24 in.; precision leveling instrument, 8, 12, 22 and 24 in.

Hillman Coal & Coke Co. Acquires Plants

UNIONTOWN, Pa., May 11.—Announcement is made officially of the purchase of the Tower Hill No. 1 and No. 2 plants of the Tower Hill Connellsville Coke Co. by the Hillman Coal & Coke Co., with headquarters in Pittsburgh. The consideration has not been disclosed. The Hillman interests, with this most recent purchase, now are the largest independent operators in the county, the operations being second only to the H. C. Frick Coke Co. The Hillman interests now have 23 operating plants with an annual capacity of 6,000,000 tons. The Hillmans acquire 750 modern coke ovens and 1500 acres of unmined coal in the Tower Hill purchase. L. W. Fogg, general superintendent Tower Hill company, will retain that position with the Hillmans, for the present at least, and he and W. W. Parshall of this city will be the local representatives of the Hillman interests.

British Steel Exports in March Again Reveal Gains

British steel exports in March this year, excluding iron ore and including scrap, were 295,716 gross tons, which compare with 231,065 tons in February and 261,248 tons in January. These exceed the outgo for any month in 1917, 1918 or 1919. The March exports in 1919 were 160,132 tons. The present rate, however, is far below that of 1913.

Iron and steel imports in March this year were 72,491 as against 71,997 in February and 79,024 tons in January. The average of 75,504 tons per month for the quarter is considerably in excess of anything in the last two years. The March imports were exceeded only three times in 1919, when the imports were 87,892 tons in October, 76,163 tons in September and 73,516 tons in November. In March, 1919, the imports were 35,136 tons.

The following summary gives the relative exports and imports for January, February and March, 1919 and 1920, and the average per month for 1913 and 1919 in gross tons:

	Exports 1919	Imports 1920
January, 1919	171,111	52,588
February, 1919	110,441	46,414
March, 1919	160,132	35,136
January, 1920	261,248	79,024
February, 1920	231,065	71,977
March, 1920	295,716	72,491
Average per month, 1913	420,757	195,264
Average per month, 1919	204,516	51,557

The trend of some of the principal exports is shown by the following data in gross tons:

	Av. Per Month 1913	Av. Per Month 1919	March 1919	March 1920
Pig iron	78,771	21,503	11,564	57,620
Steel rails	41,676	10,435	3,305	10,547
Steel plates	11,162	19,962	26,992	15,532
Steel bars	20,921	20,787	18,403	28,907
Galvanized sheets	63,506	15,508	5,745	39,927
Tin plates	41,208	24,147	22,185	25,357
Black sheets	5,679	11,109	15,385	15,226

The principal export gains in March, 1920, over March, 1919, and the 1919 monthly average have been in pig iron, steel bars and galvanized sheets.

Pig-iron imports last March were 17,620 tons against 15,500 in February, 1920, and 14,409 tons in March, 1919. The average per month in 1919 was 13,623 tons and in 1913 they were 18,059 tons per month.

Iron ore imports in March this year were 636,206 tons, bringing the total to April 1 to 1,307,975 tons as compared with 1,341,362 tons to April 1, 1919.

Manganese ore imports in March, 1920, were 34,177 tons. These compare with 38,157 tons in March, 1919, and with 50,098 tons per month in all of 1913. The total for the first three months of this year has been 84,362 tons against 95,404 tons to April 1, 1919. The average per month in 1919 was 22,150 tons.

Zinc Production in 1919

The total production of zinc in the United States in 1919, according to data by the U. S. Geological Survey, prefaced by C. E. Siebenthal, was 485,491 gross tons against 527,845 tons and 686,408 tons in 1918 and 1917 respectively. Of the 1919 output, 260,024 tons was Grade D or prime Western zinc. There were 140,917 tons of Grade C produced and 39,173 tons of Grade B. Of high-grade zinc or Grade A, the production was 45,377 tons. The 1919 output of prime Western or Grade D zinc exceeds the 1918 output by 29,194 tons.

A machine rated to pierce a hole 4 in. in diameter and 150 ft. long, horizontally, in heavy clay in half an hour was described in detail in the *Engineer*, England, issue April 9. The machine is intended for cable laying, pipe laying, draining and similar work. It operates on the principle of thrusting a stick into clay, and there is therefore no spoil. The whole apparatus is portable.

Routing Machine Parts Through the Factory*

System Covering Ordering, Planning, Scheduling and Dispatching in Use by Brown & Sharpe Mfg. Co.—Advantages and Results Obtained

BY J. A. URQUHART

THE purpose or object of routing, which in this article includes ordering, planning, scheduling and dispatching, is to enable us to start a part at the right time over the shortest and best route; to have it finished in stock or available when required; not to have it in progress for a longer period than is necessary to manufacture it; to have the part finished or in storage for a short period of time before it will be required, and to have control of the part at all times during its passage through the factory. We also purpose to be able to give positive dates on future deliveries.

Before starting the description of routing I want to speak of a few of our factory conditions, for the reason that they differ from those to be found in a fac-

ment. But in many cases the foremen would forget to send a ticket to the central station when they dispatched the work; move tickets would also get recorded on the wrong progress card. At times operations would be changed, due to various reasons, such as hard stock or because they were sent back by inspector for repairs, etc. For these and other causes the records were not satisfactory. We also used chasers, but they were expensive and did not get satisfactory results.

Before routing was introduced we had in use:

- 1.—Sample tags.
- 2.—Chasers.
- 3.—Progress cards.
- 4.—Work following tickets.

107 8 14 7-13 PRODUCTION RECORD

Mr. **POTHEN** Date **11-13-19**

Name Firm

Time No. **7214** Time Estimated Mch. **150** Man **75**

Operation **THREADING** No. of Pieces **1900**

Remarks

DRIVING GEARS 17T. G-8P.

Hours Estimated should be on this card before starting work. If you cannot do as well or better than Time Estimated notify Foreman of floor. If he cannot produce better results, he will notify the man responsible for this Record.

DATE	HOURS	PIECES	DATE	HOURS	PIECES	DATE	HOURS	PIECES
MARCH.								
Nov. 15	13.	257				MARCH. MAN		
" 16	7.	143	2500 =					
" 17	6.	128						
" 18	19.	381						
" 19	8.	128						
" 20	12	256						
" 22	18.5	363						
" 23	6.5	130				MARCH. MAN		
" 24	10.	120				GAIN 50 - 25 HRS.		
		100.0			1906			

ESTIMATE Nov. 29, 1911

CUSTOMER'S NAME

MR. THOMPSON

PLEASE ESTIMATE ON THE FOLLOWING: **MARCH. MAN**

ROUGHING

400 DIFF. GEARS 120 120

28 T. 4-5P.

MILLING OIL GROOVE 47 47

PER BLUE PRINT C-54118

TOOLS WANTED: M.H. GARVEY SULLIVAN

4 CUTTERS 3 O.D. 1 1/2 HOLE H.S.

2 SPECIAL MILL. ARBORS

1 INDEX PLATE

Nov. 29, 1911 **MR. A. MICHAND**

NOTICE:

THIS ESTIMATE MUST HAVE YOUR CAREFUL ATTENTION

BROWN & SHARPE MFG. CO.

Fig. 1. (above)—Form Furnished Foreman Who Estimates Time Required to Do the Work. Also Special Tools Required

Fig. 2. (left)—Production Record Card Which Is Used as a Check Against the Estimated Time

tory making only one line of goods. The factory consists of ten manufacturing buildings, including a foundry for cast-iron castings, and there are 7500 persons employed. We manufacture milling, grinding, gear cutting and screw machines, both plain and automatic, 84 sizes in all; also a complete line of small tools, cutters, sewing machines and barber clippers. All this varied finished product and the finished and semi-finished parts for the same are routed.

Faults of Original System

The plan in use before adopting our present system was a central station with a set of progress cards. As the work left each department a move ticket was supposed to be sent to the central station notifying them that the work had moved to the next depart-

- 5.—Dating of orders on progress cards.
- 6.—Order books.
- 7.—Dating of orders in foremen's order book.
- 8.—Lists of stock. Lists of progress kept by the various foremen.
- 9.—All drawings were mounted on metal plates or boards.
- 10.—We had to store these metal plates or boards.
- 11.—Duplication of cards, orders, etc.
- 12.—And most detrimental of all was foremen and sub-foremen leaving their own departments going to other departments chasing work.

This plan for routing gears is the outcome of our making estimates on gear work. In making estimates on gear work, especially new work, it is our practice to get the time required for each operation and delivery dates from each department that has an operation on the gear.

When estimating we make use of printed forms, one of which is sent to each foreman of the various

*A paper presented at the recent convention of the American Gear Manufacturers' Association. The author is with the Brown & Sharpe Mfg. Co., Providence, R. I.

departments who has work to perform on the piece. On this form, Fig. 1, the foreman is given the number of pieces to be estimated on and he is also furnished with a drawing of the piece for other information. This form, with drawing, is returned to the estimating department by the foreman of each department with an estimate of the number of hours required to do the work; also the special tools required by him to make the piece.

These estimates are filed for future reference. When an order that we have estimated on is received, a production record card, Fig. 2, is sent to each of the various foremen giving them a record of their estimate. This record is to remind them of what they have promised to do and gives them a space to make a record of the time spent on the job and to check up each day to determine how they are coming out.

We also use a summary card, Fig. 3, to show the sum total of labor and machine time estimated. A drawing or photostat of the gear, Fig. 3-A, is pasted on the back of the card. These cards are filed in a cabinet according to the pitch diameter of the gear. This record is valuable for quick estimating and also as a permanent record.

It was the wish to make use of this recorded information that led us to incorporate it in the form of a route card.

How the Route Card Is Made

Many of our gear orders are for special gears and are generally wanted by the customer about the time we get the order to make them. This means that the best possible date must be given. When an order of gears is received we first apply to the timekeeping department for a number for the job. All labor and material used is charged against this number. We also get from the drafting department the necessary drawing, also any list of materials or parts. This drawing

generally gives a list of any special tools that may be required. The list or order of operations is furnished or approved by the foreman of the gear department.

The next step is to get actual or estimated time for each operation from the department that has the particular operation to perform. Each department foreman is told the day that the job will arrive in his department and he gives the routing department the date on which the work will leave. The date given by the foreman who has the last operation to do gives us a final route card date, but it may not be near enough to the date asked for by the customer to be satisfactory. When this happens to be the case, the foreman of the gear department checks the routing and from his records or experience points out the operation which, in his opinion, can be shortened. The routing department then schedules a shorter date if possible. The final date is then set and the route cards are made. A number of days depending on the size of the job is added to the route card date to get a shipping date for the customer.

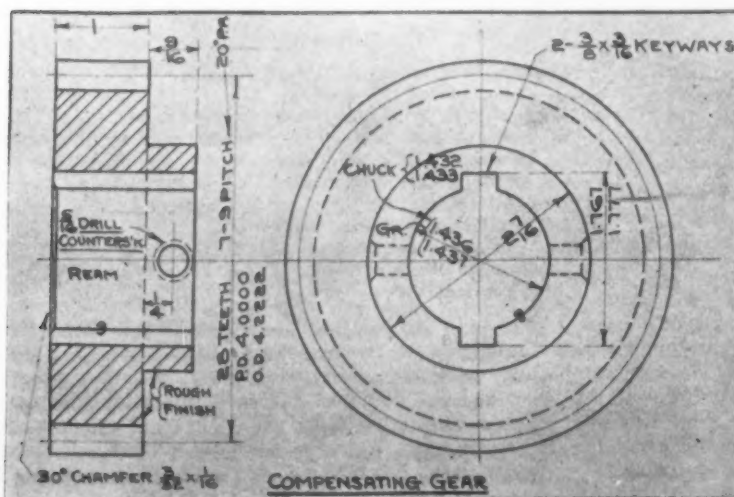
The route card is typed with a hectograph ribbon, and a copy is made on a duplicating machine for each foreman that has an operation on the gear. The route card and drawing are put in an envelope and stay with the work until it reaches the final inspection. The copies of the route card are sent to the various foremen.

The route card, Fig. 4, is about the same as a railroad time table. The "operation" and "date due" columns correspond to the "station" and "train due" columns on the table. There are, in addition, three other columns which show the date the parts were received, the number of pieces sent along, and the number of pieces spoiled, if any. The number of pieces sent along plus the number spoiled should always equal the number started. The route card is used as a casting order for cast-iron gears.

207-5 (18) 7-13 COMPENSATING GEARS		Work No. T 28	Quantity 10000
Kind For Time No.		F 7-9	Face Hole
Drawings		8 Ft. G. Cut Machine	5 BRUSH WHEELS
Pattern	CHUCKING 1248 624	O. S. Machines, and P. 23	
Forging	BRUSH 225	20 in. Spiral G. Cut Machine	
Cleaning Castings		Double Tool Grains Planer	
Machinist's Work	890	12, 24 & 36 in. Gears Planer	
Screw Machines		Bilgram Planer	DRILLING 800
Milling Machines		Auto. Rack Cut Machine	
Milling Machines, P. & W.		Auto. Grinding Machine	RVGP 1400 1400
Sp. Lathe, Special		72 in. Index Holding Machine	
General Lathe	3000 1500	Emery Wheel Grinding	1400 1400
Porter & Johnson Lathe		Filing	550
Small Vertical Boring Mill		Hardening	
Large Vertical Boring Mill		Hobs	
O. S. G. Cut Machines		Yards	
Hub Machines		Calves	
P3, P4, P11 and P13	H.S. 1600 1600	Inspection	624
P5, P6, P14 and Duplex		Boring	150
Material, 10-13 CAR. ST.	Date of Estimate	Date of Order	
FORGINGS \$			

Fig. 3 (left)—The Summary Card Shows the Total of Labor and Machine Time Estimated Fig. 3-A—A Drawing or Photostat of the Gear Is Pasted on the Back of the Summary Card

Fig. 5 (below)—If Any Work Is Spoiled, a Notice Is Sent to the Routing Department. If the spoiled parts are to be replaced, the number required are started with a new route card in order to have them catch up with the main lot as soon as possible



ROUTING DEPT.	
RECORD OF WORK SPOILED	
Quan. Spoiled	1
Sheet No.	
Quan. Left in Lot	24
Name or Symbol	SPINDLE
Time No.	C3-18
Material	#40 SPINDLE STEEL
Reason	SEAMEY STOCK
Date	3-25-20
Signed	E. YATES

ROUTING DEPT.

Please Reroute

Quantity **110**

Name or Symbol **CLUTCH THIMBLES**

Time No. **A2049-11** Sheet No **83**

From **3-26-20** To **3-30-20**

Remarks: **HARD STOCK - SENT TO BE ANNEALED**

Date **3-23-20** Signed **ABRAMSON**

Fig. 4 (right)—The Route Card Gives the Schedule for the Various Operations. It is placed in an envelope and accompanies the work to the final inspection

Fig. 6 (above)—A Reroute Ticket Gives the Information Necessary to Reroute and to Locate the Job After Rerouting

Each department in the factory is provided with a rack containing 48 pockets, four for each month. In these pockets are placed the copies of the route card as fast as they are issued. The copies are filed in the rack according to the date that they are due out of the department. This arrangement of the route card copies enables the foreman to tell at all times the quantity of work that he has to get out each week; also all work on order that he has an operation on. It also gives him this information in advance and shows up any work that he has not moved according to schedule.

Spoiled Work and Rerouting

If any pieces are spoiled a "spoiled work" notice, Fig. 5, is sent to the routing department. It is the duty of the routing department on the receipt of this notice to find out if the spoiled pieces have to be replaced and if so, to start the number required on a new route card, and have them catch up with the main lot as soon as possible.

It is necessary at times to change the dates on a route card. This change is due to various reasons, such as delay in receiving raw materials, to get a shorter date, men out, machine broken down, neglect on part of foreman, too much work, etc. To take care of this condition we have a reroute ticket, Fig. 6. This reroute ticket gives the routing department the information necessary to reroute and to locate the job after rerouting. Whenever a foreman learns that the date on a route card in his department is not going to be kept he must notify the routing department at once, and at the same time give a new moving date if possible. This reroute notice corresponds to the black-board that is set up in railway stations to keep the public notified of delays in train movements.

With the information on the reroute note the routing department can take steps to hold the final date or to make the extension as short as possible. This can be taken care of in several ways, such as overtime, getting help from another department, as we have several departments doing similar work, by doubling up, etc. But the important thing is for the foreman to give prompt notice to the routing department in order that the control of the job may not be lost. I wish to say that as a rule the foremen give this notice. We do not use chasers or follow up men except in special cases. When a date cannot be kept the reroute slip gives the date on which the work will move out of the department. We make out a reroute card, take it to the department which has the work, take the drawing out of the envelope, and put it in the reroute envelope and take away the old route card. The fact that there is always a route card with the work helps the routing department to have control of all the work in progress at all times.

TIME NO.	TOTAL ON ORDER	PART. MARK OR SYMBOL	QUANTITY ROUTED		
2926	190	Sets	last 50		
NAME OF PART Bevel Pinion - Mercer 3755D					
MATERIAL	WHS. DIA.	WHS. LENGTH	CODE		
See Print			9-12-19		
OPERATIONS	BENCH FLOOR	DATE PARTS ARE DUE IN DEPT.	DATE PARTS WERE RECEIVED	No. OF Pcs. SENT ALONG	No. OF Pcs. SHIPPED
Print received		8-9-19			
Deliver forgings to McGhee Reeds		6-10-19	6-10-19	50	
Turn McGhee		6-10-19	6-10-19	50	
Inspect Baird		7-7-19	7-3-19	50	
Drill Huse		7-9-19	7-7-19	50	
Grind White		7-11-19	7-9-19	50	
Thread Pothin		7-15-19	7-10-19	49	1
Chuck Earle		7-19-19	7-14-19	49	
Rough and Finish out Maxfield		7-23-19	7-23-19	48	1
Pile Huse		7-31-19	7-30-19	48	
Inspect Baird		8-1-19	8-18-19	48	
Finish turn McGhee		8-13-19	8-18-19	48	
Mill Tompcon		8-15-19	8-19-19	48	
Pile Huse		8-19-19	8-21-19	48	
Pile soft inspect		8-20-19	8-22-19	48	
Harden Henry		8-22-19	8-23-19	48	
Brush and pick up center Huse		8-28-19	8-30-19	48	
Test for trueness Baird		8-30-19	9-3-19	37	11
Grind White		9-3-19	9-5-19	37	
Grind Inspect		9-10-19	9-12-19	33	4
Huse		9-11-19	9-13-19	33	
Final Inspect		9-11-19	9-13-19	33	
Ship		9-12-19	9-13-19	33	
Auto Department					
6-23-19					
Code					

Work is scheduled to department, not to machines, except on certain machines, such as gear planers, hobbing machines, etc., where the number of machines are limited. On the common class of machines such as lathe, drill press, etc., we depend on the foreman with the aid of his route card rack to bring to the attention of the general foreman any work that he is not sure of getting out according to schedule. This plan has its weak points, but any cure that we have seen is worse than any trouble we are having at the present time.

Each foreman dispatches the work from his own department. The moving is done by the trucking department, but the foreman who works on the job last is responsible for the work until it reaches the next department.

All moving of parts in the factory is handled by the trucking department. Call stations are located in each department of the factory and there is one central transfer station. Starting in the morning each trucker leaves the transfer station with any parts that are going to his station. Upon his arrival at the floor where his station is located he distributes his load, and going to his station he loads up with the parts for the transfer station. The route card with the work is the trucker's move order.

How Stock Orders Originate

Machine parts are generally routed to go into stock and as a rule we have more time allowed for manufacturing than on special orders. This allows us to use some methods different to those we use in routing gears, but most of the rules are the same.

All orders for standard machinery originate in the sales department. Copies of orders are sent to:

- 1.—The timekeeping and cost departments. They open accounts for time and material and figure cost at completion of job.
- 2.—The drafting department. They furnish all necessary drawings and lists of furnishings including stock parts.
- 3.—The foreman erecting the machines. He gives a date

Time No.		Total on Order	TYPE OF MACHINE								
B00-14		25	#00 HAND MILLING MACHINES								
Ordered 10-3-19											
Cast Only		General Remarks									
Go Ahead 10-3-19											
Stopped											
Sheet	Received	Cast Order	Sent R. D.	Routed	Remarks	Sheet	Received	Cast Order	Sent R. D.	Routed	Remarks
						43	10-9-19		10-24-19	11-1-19	
						44	10-9-19		10-24-19	11-3-19	
						45	10-9-19		10-24-19	11-3-19	
						46	10-9-19		10-24-19	11-3-19	
						47	10-9-19		10-24-19	11-1-19	
6	10-9-19		10-24-19	11-3-19	STAND.						
7	10-9-19		10-24-19	11-3-19	KNEE						
8	10-9-19		10-24-19	11-3-19	SADDLE	50	10-9-19		10-24-19	11-3-19	
9	10-9-19		10-24-19	11-3-19	TABLE	51	10-9-19		10-24-19	11-3-19	
10	10-9-19		10-24-19	11-3-19	DRIP PAN						
11	10-9-19		10-24-19	11-1-19	STAND DOOR	53	10-9-19		10-24-19	11-6-19	
12	10-9-19		10-24-19	11-3-19	C WEIGHT.	54	10-9-19		10-24-19	11-3-19	
13	10-9-19		10-24-19	11-3-19	BUTT.						
15	10-9-19		10-24-19	11-3-19	SADDLE GIB						
16	10-9-19		10-24-19	11-3-19	TABLE GIB	56	10-9-19		10-24-19	11-3-19	

Fig. 7.—Record of Drawings Received in the Routing Department

when the machines will be finished. This date must be approved by the routing department and be satisfactory to the sales department.

4.—Routing department. They, on receipt of lists, and drawings, make requisitions for all stock parts and material. These requisitions bear the date that parts will be wanted in the assembling or erecting departments. They also order through the purchasing department all special materials or parts. Parts not carried in stock but manufactured as required are routed through the factory.

When the lists of material for a lot of machines are received in the routing department from the drafting department the stock parts order clerk immediately checks the list with his stock record cards. All the items required that are not in stock are ordered. Items not required for some time are held in the "Tickler" until an advisable date for ordering. A copy of the order is sent to the drafting department, who in turn send to the routing department drawing for each piece called for on the order. The material order clerk in the routing department takes each drawing and makes out requisitions for all stock parts; also requisitions for all special parts. The drawing, all requisitions, and a route card without the operations or dates, but giving the number of pieces required, time number of job and name of part, are then sent to the route clerk, who proceeds to schedule and route the work. These stock record cards are a great help to the route clerk in setting dates.

The material order clerk keeps a record, Fig. 7, of all the drawings received in the routing department. This record gives date received, when sent to routing department, and when routed.

How the Master Card Is Used

The method of routing is as follows: We have a master card, Fig. 8, for each piece to be routed. This card gives the operations and the number of hours or days required for each operation. It also gives the name of the foreman who is to do the work. This is necessary because we have several departments for doing the same kind of work, such as lathe, milling, drilling, etc.

The operations on our master cards are made by recording the operations in the order in which they have been performed in the past, and are changed from time to time as new methods of manufacturing require. The time required for each operation is taken from the contract or job work cards when avail-

able. On new work we get an estimated time from the foreman having charge of that particular job.

We have from the foreman building the machines the date on which the machines are to be finished.

We have records obtained by experience to show the time that each part or group must be finished in order to keep the date set on the complete machine. With all this information it is a comparatively simple job to divide the available time between the various operations. In the majority of cases the time given on the route card is greater than the actual time required for the operation. This helps us to hold the original date on the route card when we have to re-route.

On rush orders the route card is put in a red envelope. This helps the foreman to keep the job moving on time, unless they should become too common.

Record of Work in Progress

The routing department has two sets of filing cabinets, one for all work in process of manufacturing and one for work that has been finished. The work-in-progress cabinet contains a copy of the route card for every job in progress filed according to name or job number. The completed file contains a copy of route cards for all jobs finished on which the cost has not been figured. As fast as the cost department figures the job the cards are pulled out and destroyed. With the aid of these two cabinets we can locate any job very quickly. We can also give the condition of all the parts for any lot of machines under construction.

Rules to Be Followed

Rules to be observed in carrying out the system are issued as follows:

- 1.—Dates on route cards should be kept or bettered.
- 2.—If a date on route card cannot be kept, the foreman should notify the routing department at once and not wait until work is finished, and on the same note give the date on which the work will go to the next operation. This reroute note should be written in duplicate, the original should be sent to the routing department and the duplicate should be pinned to the foreman's route card and filed in rack according to the new moving date. This will remain in rack until receipt of the new reroute copy from the routing department. Printed forms are provided for this purpose.
- 3.—Foremen should write "Being Rerouted" on route card and sign their name and date, whenever notifying the routing department to reroute work.
- 4.—Routing department must reroute work promptly, but

work must be kept moving during the time it is being rerouted. If a route card arrives in a department and has been marked "Being Rerouted" but has not been rerouted within three days after the date of notification, the foreman having the work must send through a new reroute note.

5.—If a job should get so far behind that it is difficult to reroute to meet machine date, the routing department will notify the foreman building the machines.

6.—The route card and blue print in envelope must be kept with the work, not on the foreman's desk.

7.—The foreman's copy of the route card must be filed in racks, provided for that purpose, according to the date the work is due out of the department, excepting the assembling and erecting departments on groups or machines. They should file route card by time number.

8.—Copies of route cards for jobs that have been rerouted or finished must be removed from rack promptly.

9.—Foremen must not use racks to store all sort of junk. If jobs are stopped the copies should be marked.

10.—All foremen must enter on their copy of route card the date on which they receive the work. Then the routing department can get this information without troubling the foreman.

11.—Route card with blue print must be returned to routing department promptly upon completion of job.

12.—The routing department is responsible for getting best dates on all outside repair orders, "customer waiting orders," etc. It is expected that the foremen will assist them in every possible way.

13.—The foreman whose name appears on bottom of each route card is responsible for the work and will give information on any mechanical question that may come up.

Results Obtained

Routing started in the gear department in 1912, and is now in general use through our factory. The results obtained are given below:

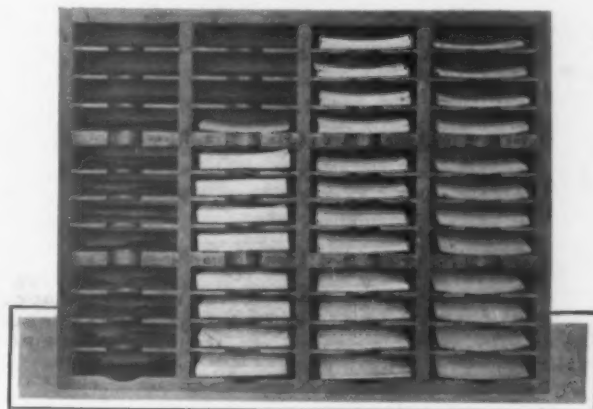
Year	Total	On Time, Per Cent	1 Week, Per Cent	2 Weeks, Per Cent
1913.....	24,990	76.5	84.0	89.5
1914.....	28,037	80.9	90.5	94.3
1915.....	43,795	68.5	80.3	88.7
1916.....	61,173	71.5	79.0	86.5
1917.....	66,926	87.6	90.7	93.8
1918.....	66,817	85.0	88.0	91.7
1919.....	61,622	85.0	87.6	90.0

MASTER CARD		NO. OF PIECES	PATT. MARK OR SYMBOL	MATERIAL
TIME NO.				
JB10-		25	JB 10 1	C.I.
NAME OF PART	Bed Front Plate Sheet #9			
U OPERATIONS	FOREMAN	ACTUAL TIME IN DAYS		REMARKS
Print received at	R.D.			
Make castings	Foundry	25		
Clean	Arbour	3		
Mill	Malmberg	4		
All drilling	Larson	6		
Finish Milling	Malmberg	4		
Furnish Bed Front Plate Cover also file and fit covers	Johnson	3		
Spline	Lamphear	2		
Wash	Phillips	2		
Fill And paint	Lee	5		
Counter-bore and drill for Front Plate Cover	Larson	5		
Assemble, Continue operation as Bed Front Plate and Mechanism complete	Johnson	15		
Final Inspect	Platt	2		
Supply Department #7 Bldg. 1st Floor				
Buckley				
These JB10 Bed Front Plates complete are required six weeks ahead of the delivery date on the finished machines.				
TOTAL ACTUAL TIME		76		

Fig. 8.—A Master Card for Each Piece Gives the Operations and the Number of Hours or Days Required for Each Operation

This record would be better but for the tendency of our route clerks to play safe. They sometimes call for parts sooner than actually required, and quite often the foreman making the part knows this and breaks the rule on rerouting, making the excuse that he knew that they would not be required on the date set. This applies mostly to the foreman on the last operation.

We try to impress the foreman, however, with the fact that dates on route cards must be kept, and if, in



A Route Card Rack. There are 48 pockets, four for each month. The cards are filed according to the date they are due out of the department

their opinion, the dates are not correct, they should call them to the attention of the routing department.

Benefits of Routing

The benefits of routing are briefly outlined below:

- 1.—Work is all laid out for foremen so that they can devote their whole time to getting out the work.
- 2.—Every part that should be is started as soon after the order is placed as is necessary to get the part finished on time.
- 3.—True dates. Men are not working on parts before they should, but are working on the parts that are wanted.
- 4.—It calls attention to departments that have more work than they can get out on time.
- 5.—Saves trucking.
- 6.—Shows why jobs are delayed. Waiting for tools, etc.
- 7.—Prevents breaking up of lots.
- 8.—The route card, when finished, gives a complete history of the job from the date of the order until finished.
- 9.—Keeps all foremen in their own departments.
- 10.—Time is not wasted following up jobs that are on schedule, as only jobs that are liable to be delayed are looked up.

We plan with the understanding that the firm will furnish the men and equipment necessary to manufacture all work that is routed. Foremen being notified in advance of the quantity of work ordered and the date that it will be required are enabled to give the management a list of the equipment and men necessary.

This system was installed in the factory without any confusion and met with little if any opposition from the foremen. In fact, part of the success is due to the co-operation of the foremen. The cost of installing the system is very small, because it does not call for any expensive books or equipment. All that is required is a few simple printed forms.

The Pittsburgh Purchasing Agents' Banquet

The Purchasing Agents' Association of Pittsburgh, a branch of the National Association of Purchasing Agents, gave its annual banquet in the Fort Pitt Hotel, Pittsburgh, Tuesday evening, May 4. It was very largely attended, and one of the most successful ever given by this association. The officials of the Purchasing Agents' Association in Pittsburgh are C. T. Stewart, Harbison & Walker Refractories Co., president; G. W. Sanborn, United Engineering & Foundry Co., vice-president; S. E. Van Vranken, Locomotive Stoker Co., second vice-president; J. E. Stauffer, A. M. Byers Co., third vice-president; H. Llewellyn, Pittsburgh Steel Products Co., treasurer; G. H. Beymer, Standard Underground Cable Co., secretary.

HIGHER FREIGHT RATES

Railroads Show Expenses Increase More Rapidly than Receipts

WASHINGTON, May 11.—There is little prospect of reductions in either wages or prices of materials in the immediate future, according to railway executives who have begun the presentation of data to the Interstate Commerce Commission relative to the need of increased freight rates. The carriers estimate that the railroads of the country need additional revenues amounting to \$1,017,000,000 annually. The advances would represent an average increase in freight rates of approximately 28 per cent.

In a comprehensive statement filed by Daniel Willard, president of the Baltimore & Ohio Railroad, for the carriers of the Eastern district, figures are given showing that the expense basis has been increased 99.1 per cent since 1916, but that the revenue basis during the same period has increased but 36.37 per cent. The amount of additional revenue needed by Eastern roads is estimated at \$550,000,000, which could be obtained by an increase of about 22 per cent if applied to all business, or about 30 per cent if applied to freight rates only.

Mr. Willard, in discussing the effect of abnormal conditions during the past few months, said that neither the steel strike nor the coal strike affected the earnings of the Eastern carriers seriously. During the steel strike shipments of steel products were largely maintained from the accumulation of stock.

Attention is called by Mr. Willard to the fact that increased interest rates are necessary to obtain new capital for railroad financing. He says that the cost of new capital is more than seven per cent even to railroad companies whose credit is of the best. The Government Victory loan bonds are selling on a basis of return in excess of six per cent, he points out.

During 1920 and 1921, it is noted, from \$200,000,000 to \$250,000,000 per annum of maturing obligations of the Eastern roads, now bearing low rates of interest, some as low as three and one-half per cent, must be taken care of and in such financing the railroads must secure funds on the basis of current costs of capital.

C. H. Markham, president of the Illinois Central Railroad, in a statement filed with the commission on behalf of the Southern roads, says that with a property investment of \$2,284,000,000, and revenues of \$577,000,000, the net annual income basis of the railroads in the South has been reduced to \$16,269,000, or less than one per cent on the investment. He declares that the Southern roads need additional revenues amounting to \$120,770,000.

The conditions that exist under the new transportation act are different than formerly. The commission now is required to take the initiative in bringing the rates up to the required level, whereas formerly the commission took no steps except upon application of the carriers. The information that is now being presented to the commission by the carriers is not in the nature of an application, but for the guidance of the commission in reaching its decision. The commission is expected to announce increased freight rates before the expiration of the six months' period following the date when the act became effective, during which the Government guarantee continues in effect.

What the Railroads Need

Samuel M. Felton, as chairman of the Western Executives' Rate Committee, in presenting an application for increased revenues for the Western roads, gave some figures relative to the need of new equipment. Mr. Felton said that the railway executives had figured that the railways of the entire country need 100,000 freight cars, costing \$370,000,000; 2000 locomotives, costing \$130,000,000; 3000 passenger cars, costing \$90,000,000; and 1000 baggage cars, costing \$20,000,000, a total of \$610,000,000. Mr. Felton said that the Western roads need additional revenues

amounting to \$352,893,000 to make it possible for them to yield a 6 per cent return on a property investment of \$8,963,883,000.

The same figures as to the needs of new equipment referred to by Mr. Felton were brought out by a committee of the Association of Railway Executives which appeared before the Senate Committee on Interstate Commerce to advocate that the \$300,000,000 revolving fund provided in the transportation act for loans to carriers be increased to \$800,000,000. While the figures cited by Mr. Felton were also used by Edward N. Brown, chairman of the Railway Executive Committee, as the total equipment which the carriers believed should be purchased this year, Mr. Brown said that the actual shortage in equipment totals 226,000 freight cars, 9450 passenger cars, and 3190 locomotives. Purchase of this amount of equipment, Mr. Brown said, would require an expenditure of \$1,600,000,000.

National Screw Thread Commission Report Approved

The progress report of the National Screw Thread Commission, Washington, has been approved by the commission and is now available. The report covers the standardization of only those threads, sizes, types and systems which are of paramount importance by reason of their extensive use and utility. Information is given to permit the writing of definite and complete specifications for the purchase of screw thread products, and the application of the specifications is explained in detail.

It is recommended by the Commission that the United States standard or Sellers' profile, hereafter to be known as the National Form of Thread, be used for all screw thread work except where otherwise specified for special purposes. The coarse thread series recommended are the present United States standard threads supplemented in the sizes below 1/4 in. by the standard established by the American Society of Mechanical Engineers. The fine thread series consists of sizes taken from the standards of the Society of Automotive Engineers and the fine thread series of the American Society of Mechanical Engineers.

The report establishes for general use four distinct classes of screw thread fits with subdivisions which, together with specifications, are explained as for the purpose of insuring the interchangeable manufacture of screw thread parts throughout the country. Tolerances are given for loose fit, medium fit (regular and special), and close fit. Extensive tables give the tolerances and dimensions for each class of fit. Tolerances and dimensions are included for fire hose couplings and small hose couplings. A complete gaging system which has been found adequate in the production of war material is specified in detail.

The material on pipe threads was prepared by a special committee of manufacturers on standardization of fittings and valves, and published under the title of "Manual on American Standard Pipe Threads." It has been indorsed by the American Society of Mechanical Engineers and the American Gas Association, and is adopted by the commission with only such changes as are necessary to bring it into conformity with the remainder of the report.

Public Hearing on Pennsylvania Safety Standards

Public hearings will be held upon proposed rules relating to the operation, use and maintenance of machine tools before the Safety Standards Committee of the Industrial Board of Pennsylvania at the Hotel Bellevue-Stratford, Philadelphia, May 24, and at the Public Safety Building, Pittsburgh, May 28. The rules cover the employees' and employers' responsibilities relative to the removal and replacement of guards attached to machinery, and specifications for starting and stopping devices to be provided. Copies can be had upon applying to the secretary of the Industrial Board, Fred J. Hartman, Keystone Building, Third Street, Harrisburg, Pa.

San Francisco as a Steel Exporting City

Convention City Has Many Advantages and
Is Becoming a Leader in Foreign Ship-
ments—Heavy Shipments to the Far East

SAN FRANCISCO, by reason of its excellent geographical position, its harbor facilities, railroad connections, and numerous steamship lines radiating to every country on the Pacific, is fast becoming the leading Pacific port of export for American steel products. Hence it is of special interest to delegates to the Foreign Trade Convention in session this week.

During the fiscal year 1918-19 a total of 496,051,199 lb. of iron and steel, valued at \$46,137,454, was exported through the port. Of this amount over \$20,000,000 worth of iron and steel was exported to Japan. One of the largest items for the past two years has been ship plates for Japan. A large per cent of these ship plates was used in the construction of 30 steel cargo carriers for the United States Shipping Board. A number of these vessels have been delivered during the past few months, and many of them are now engaged in the Trans Pacific trade. One of these steamers, the Eastern Merchant, recently sailed from San Francisco with more than 5500 tons of steel for the Orient. The principal items were 2000 tons of steel rails for Yokohama, and 450 tons of bar steel and 300 tons of ship plates for the same port. For Kobe there were 450 tons of bar steel, 400 tons ship plates and for Shanghai 500 tons of steel bars. This steamer is operated by the Pacific Mail Steamship Co. During the same week the Pacific Mail dispatched two other steamers for the Orient, each carrying about 4000 tons of steel. One of these steamers, the West Caddoa, carried 1700 tons of steel for Yokohama, 1200 tons for Kobe and 100 tons for Shanghai. The third steamer, the West Conob, carrying about 4000 tons of steel

as follows: Steel bars, scrap iron, heavy steel rails, structural steel for Kobe, boiler plates for Shanghai, sailed from San Francisco, inaugurating a regular round-the-world freight service for the Pacific Mail Co. The West Conob's regular ports will be Yokohama, Kobe, Shanghai, Manila, Saigon, Singapore, Calcutta, Colombo, Bombay, Alexandria, Marseilles and Barcelona, Baltimore, Md., and returning to San Francisco, via the Panama Canal. The service is distinctive from the usual "tramp" service heretofore followed by American operators on which vessels pick up chance cargoes at any port.

In the accompanying photos, Nos. 1, 2, 3, 4, 5 and 6 show the activities at the Pacific Mail docks, during the loading of the three steamers previously mentioned. No. 1 shows nine cars of steel and pipe being loaded onto the Eastern Merchant. No. 2 shows the West Conob taking on steel. In the foreground are two cars of steel for reinforced concrete. In the distance can be seen a car of pipe, and a car of boilers. No. 3 shows the method of handling ship plates to steamer West Conob. No. 4 shows the loading of steel for the construction of coconut oil storage tanks in Manila. No. 5 shows a car of scrap iron, and No. 6 is an interior view of the Pacific Mail docks showing a large shipment of tin plate for Yokohama.

In the accompanying photos Nos. 1, 2, 4 and 5 show how the ship and railroad car are brought close together so as to promote dispatch and cheapness in transferring cargo, at the San Francisco docks. San Francisco undoubtedly now has the most complete harbor belt line railroad switching system in the country. The railroad



Fig. 1. — Nine Carloads of Steel, Largely Pipe, Being Loaded on the Eastern Merchant



Fig. 2.—This and the Other View Show How Cars and Ships Are Brought Closely Together

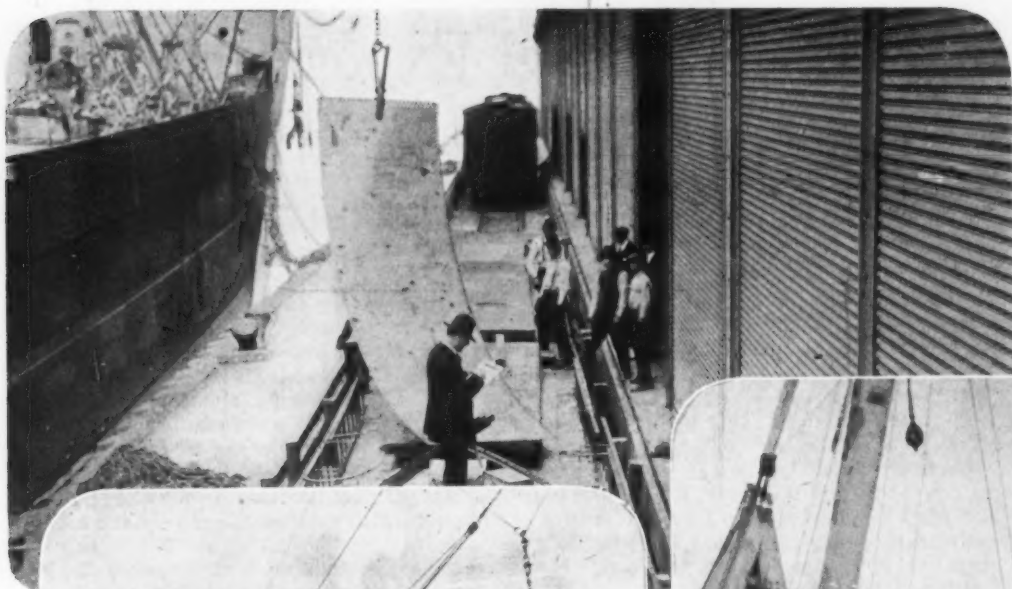


Fig. 4.—The Way
Plates Are Tak-
en from Rail-
road Car to
Ship

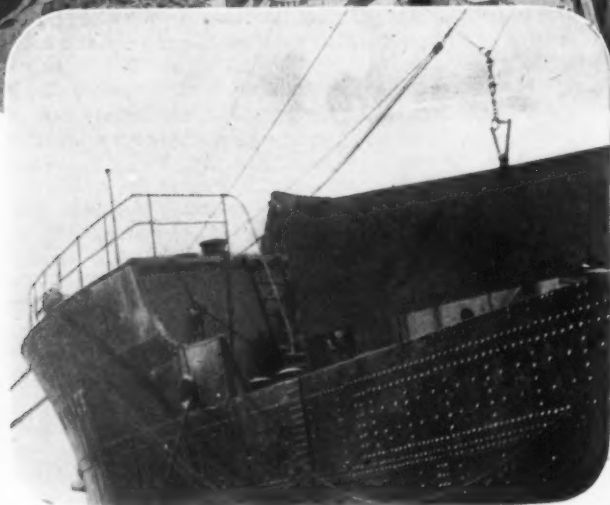


Fig. 3.—Plates for Coconut Oil Tanks at Manila

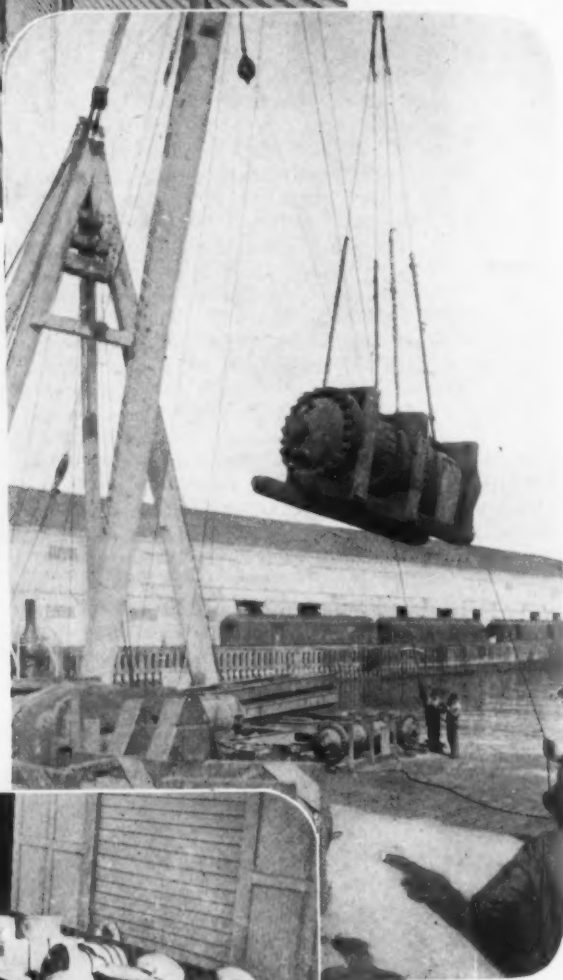


Fig. 7.—Handling
Heavy Machinery
Received at San
Francisco Before
Steamer Sailing Is
Scheduled

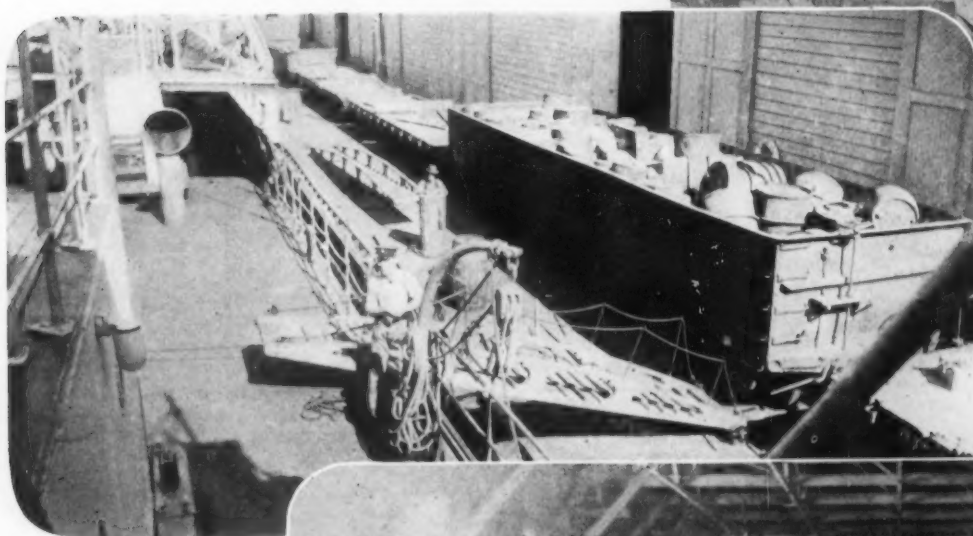


Fig. 5.—Scrap Iron
at Pacific Mail
Dock

Fig. 6.—Shipment
of Tin Plate for
Yokohama



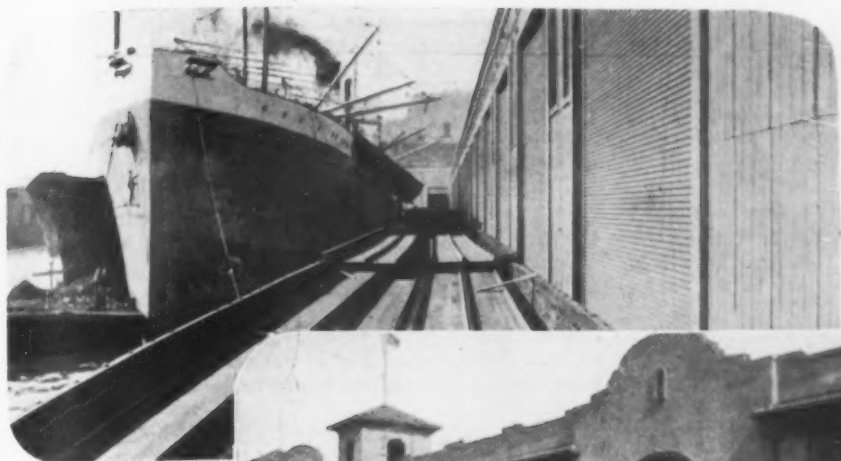


Fig. 8.—Structural Steel
Alongside the Ship to
Take It to Java

Fig. 9.—Truck-
ing Steel Shapes
to Go to the Ha-
waiian Islands



is located on the Embarcadero, a marginal thoroughfare 200 ft. wide, located just behind the sea wall, and the system is intended and is used to connect up, for the switching of freight cars, the various piers, the yards of other railroads, and private warehouses and industries generally.

The belt line railroad is owned and operated by the State Harbor Commission. There are three State-owned freight car ferry slips, where all cars are delivered and received from the Santa Fe, Western Pacific and the Northwestern Pacific roads. There is also connection with the lines of the Southern Pacific, where all cars from that company are delivered and received by the belt line. All cars delivered at the rail transfer and at the three-car ferry slips are promptly picked up by the belt railway and delivered immediately to the pier, or to the storage yards along the water front as ordered by the consignee or consignor. The railroads absorb the switching charge to and from the piers on line hauls, thus relieving the shipper of that charge.

It has been the policy of the Harbor Board not only to equip all new piers with spur tracks running the full length of the piers, but also, wherever the water slip spaces beside the old piers were sufficiently wide to permit of it, to widen existing piers and place spur tracks thereon.

Where there are tracks on both sides of the pier the usual practice is to make one a surface track and the other is depressed so as to bring the floor of the railroad car on a level with the floor of the pier, thus facilitating trucking of certain classes of freight. Most spur tracks along the piers are capable of holding nine cars, thus making it possible to load into all hatches of a vessel. As soon as the cars are unloaded a Belt Line locomotive removes them to the storage tracks along the Embarcadero and immediately delivers waiting loaded cars to the pier.

Photo No. 7 shows the method of handling heavy machinery arriving in San Francisco before the steamer is scheduled to sail. Machinery that will not be damaged by exposure to the weather is sometimes unloaded from the car to the bulkhead between the piers. The Harbor Board makes a very small charge for this storage. When ready to be loaded onto the steamer one of the large floating derrick barges docks at the slip, and the machinery is loaded onto the barge. The barge is later towed alongside the steamer, and the machinery taken aboard either by the ship's tackle or the derrick aboard the barge.

The cost of loading iron and steel at San Francisco docks is as follows:

Sheet iron, bar and bundle iron under 3 in. in diameter, gas and water pipe, \$1.10.

Bar iron 3 in. in diameter or over, structural iron, rails, machinery, pipe, plates, angles, beams, girders, blooms, \$1.50.

Scrap iron and all other commodities over 4000 lb., special rate.

The harbor at San Francisco is owned by the State of California and all its affairs are administered by a commission composed of three members, appointed by the Governor and known as the Board of State Harbor Commissioners. The harbor is maintained by revenue derived by dockage on ships, tolls on cargo, Belt Line switching, rentals of docks, etc. The harbor has been self-sustaining from the beginning, and must, under the law, continue to be. The harbor thus pays its own way—not a dollar coming out of the State treasury or the treasury of San Francisco in the way of taxes.

The harbor has been practically rebuilt during the past seven years, and during this period of reconstruction many new piers of the most modern type have been built. A number of piers are of steel and concrete construction, as shown in photos Nos. 2 and 4. The Harbor Commission has started on a program for improved mechanical handling of cargoes, and is pushing new construction in new territory with all the energy and means at command, in order to make the port the gateway to the Orient.

While the export of iron and steel from San Francisco to Japan and China is very heavy, other countries, such as the Dutch East Indies, Philippines, and the Hawaiian Islands, are taking large quantities.

Photo No. 8 shows the Java Pacific steamer Soerakarta taking on a cargo of steel for Java. There was 2973 tons of steel in this particular shipment, which was consigned to Batavia. It consists of structural steel 52 ft. in length, which was used in the construction of railroad bridges on the line of the East Java Railway, 3000 tons of steel rails were taken to the Indies by this steamer on her previous voyage. Machinery, galvanized iron, nails, wire, pipe rails, structural steel and oil well and oil refinery equipment comprise the bulk of the exports through San Francisco to the East Indies at the present time. Machinery totaling 286 tons was taken aboard the Soerakarta for Batavia, which was installed in the coconut oil mills. While the production of copra on a large scale has

been carried on in the islands for many years, the construction of mills for expressing the oil from the copra has been attempted during only the past few years. This industry also created a big demand for material for constructing steel storage tanks in Java. The coconut oil mills are usually built in the interior, and the oil transported to the seaport for shipment in the double bottoms and special tanks of steamers. This necessitated the construction of immense steel storage tanks to handle the oil until the arrival of the steamers. On the arrival of the steamer the oil is pumped from the storage tanks on shore to the tanks of the steamer.

Very little iron and steel was exported from San Francisco to the Dutch East Indies previous to the year 1914. In the year 1915 the East Indian exports from San Francisco increased, but in 1916 the dislocation of established routes, with the hazards of making European ports, gave the first real impetus to trade between San Francisco and the Dutch East Indies.

Photo No. 9 shows some of the steel products which are exported in large quantities to the Hawaiian Islands, consisting of boilers, tractors, structural steel, road-building equipment, engines for the sugar mills, sheet tin for the pineapple canning factories, boiler tubes, pig iron, castings, corrugated iron for roofing, etc.

A very large percentage of shipments for the Hawaiian Islands is now carried on the steamers of the Matson Navigation Co., although vessels of the Pacific Mail and Japanese lines touch at Honolulu.

Sheet tin for the pineapple canning plants is shipped on practically every Matson steamer leaving San Francisco for the islands, and during the early fall each steamer of this company carries from 500 tons to 600 tons of sheet tin. The pineapple pack for 1919 totaled 5,071,976 cases, and it is expected that the 1920 pack will reach a total of 6,000,000 cases. Large shipments of structural steel in truss form are carried by the Matson steamers. Two or three cars of corrugated iron for roofing are taken out on every Matson steamer. Other iron and steel products shipped to the islands in large quantities are, heavy fence material of woven

wire, staples and bales of wire, pipe and valves, steel rims for plantation wagons, horseshoes, gasoline engines for irrigation, telephone wire, steel cable, galvanized buckets, metal wheelbarrows, heating coils and tanks.

Photo No. 4 shows the loading of steel for the construction of coconut oil storage tanks. This steel is for shipment to Manila. A few years ago there were only two coconut oil mills in the Philippines, but at the present time there are 46 mills, each having a number of steel storage tanks for storing the coconut oil until the arrival of the steamer that is to transport the oil to Europe or to the Pacific coast of the United States. Some of these storage tanks have a capacity of 7000 tons of oil. Most if not all the steel used in the construction of these tanks are fabricated in the United States.

Photo No. 7 shows part of a shipment of cast steel pipe water-wheels and valves for a 90,000-hp. hydro-electric plant, built by the Pelton Water Wheel Co. for the Andhra Valley Power Co., India. The water-wheels built by this company, of which there were six of 15,000-hp. each, are said to be the largest single overhead impulse turbine ever built.

Following is the export tonnage figures of iron and steel for January, 1920, from San Francisco, as compiled by the Board of State Harbor Commissioners:

For China, Chosen and Hong Kong, 3183 tons; Central America, 50 tons; Canada, 8 tons; Asia, all others, including Ceylon, 36 tons; East Indies, 114 tons; Hawaiian Islands, 750 tons; Japanese Islands, 9176 tons; Oceania, including South Pacific Islands, 6 tons; Philippine Islands, 546 tons; total, 13,969 tons.

The shipment of iron and steel is greatly increasing at the present time, as the tonnage of the three steamers dispatched by the Pacific Mail, and referred to in this article, amounts to more than the shipments for January by all steamship concerns.

During the month of January, 1920, 2319 tons of machinery, 1634 tons of tinplate, 891 tons of wire, 1127 tons of pipe and fittings, 1299 tons of nails, 2126 tons of railroad track material were shipped through the port of San Francisco.

Vast Openings for American Enterprise

President Farrell Predicts that in Place of Jealous Political Policies there Will Be Broader International Co-operation—Address at Foreign Trade Convention

AT the Seventh National Foreign Trade Convention at San Francisco, May 12, James A. Farrell, president United States Steel Corporation, and chairman National Foreign Trade Council, delivered an address on "The Relation of Our Industrial Capacity to Our Foreign Trade." He said in part:

"When we are confronted by the fact that the imports and exports of the United States for the calendar year 1919 amounted to nearly \$12,000,000,000—in round figures, \$11,800,000,000—as against \$4,258,000,000 for the year before the war, it would appear to be superfluous to insist that we must become a foreign trading nation. The figures would seem to indicate that, consciously or unconsciously, we were already there. But figures must be interpreted with due regard to the facts for which they stand, if their true meaning is to be extracted. A close approach to a three-fold expansion of our foreign trade in five years marks a sufficiently impressive chapter of our industrial and commercial history, but its true meaning will escape us unless we can clearly define in what the expansion consisted. The value is there, but how about the volume? Have the tons, the yards, the gallons for which the dollars stand, increased in anything like the same proportion as the recorded values? We all know they have not. A careful comparison of the returns of our foreign trade for last year with those of five years ago, would probably show that prices have advanced in much greater proportion than quantities. "It is true that even when measured solely by the

volume of expansion the rate of progress has been much greater than that established during any preceding five years. But the advance made in the agencies and instruments of production has been on an entirely unexampled scale, and the conclusion is brought home with an entirely new emphasis that American industrial development has reached the stage when the United States must become, in all that the words imply, a foreign trading nation. That involves the further requirement that the American people generally must understand their personal relation to the international commerce of the country as a whole; they must realize that it is not only those directly connected with foreign trade but every inhabitant of the land, wherever located and however occupied, that shares in its benefits and bears a direct responsibility for its continued success. In other words, the whole people must be prepared to join in giving sustained and intelligent support to the efforts of those who, whether in Government employ or in private enterprise, are charged with the obligation of directing and maintaining this increasingly important factor in our common life.

Growth of Small Companies

"It is a great mistake to assume that the plant expansion which took place in 1917-1918 on so vast a scale in all the industrial sections of the United States was accomplished only by concerns of great magnitude and large capital. It is true that it was achieved on a colossal scale by certain establishments,

usually, though not always, with the aid of liberal government financing. But omitting government expenditure from the reckoning, the expansion affected by the larger concerns is probably not the major part of what actually took place. In every industrial section of the country—along the Atlantic Coast, in the South, in the Middle West especially, and on the Pacific Coast, many hundreds of concerns, individuals, partnerships and corporations busied themselves in increasing their productive capacity in order to help meet the insatiable demand of our own Government and the governments of the Allies for production, and in order that we might at the same time do all we could to meet the pressing demands from those markets which had been cut off from their usual sources of supply.

Ohio a Huge Workshop

"The State of Ohio has been aptly described as a huge workshop. In one district of the State, embracing but a comparatively small part of its area, several sheets of closely typewritten paper would be required to list, one name to a line, the plants which were expanded in response to this demand. The reports from that district show that in the great majority of cases the capital of the concerns making such enlargement was under \$250,000, and that the expansions themselves ranged in cost from \$10,000 to \$100,000. Reports specially prepared for the National Foreign Trade Council show that the situation in the district cited is fairly typical of the whole industrial area of the country. The census taken this year will no doubt disclose with reasonable accuracy the full extent of the marvelous industrial changes which have been affected during the last five years, but it is too early as yet to have any reliable information from that source. What is apparent to all, however, is that this development was superimposed upon an industrial structure which, before the war, was capable of producing a substantial surplus of manufactures for export. The situation has been obscured to some extent by the long duration of the war and the consequent exhaustion of reserve stocks of all kinds throughout the world. The withdrawal of from 25,000,000 to 30,000,000 of men from active production to engage in military service, and the greatly increased consumption by these men of the output of the largely reduced number of producers, resulted in an eager but abnormal demand upon our production during the war. The exhaustion of the world's reserve stock has projected into the first years of peace that abnormal demand upon our industrial resources. The psychological reaction resulting from the long strain of war has greatly lessened the ratio of production by unit of labor in all countries—in those directly engaged in fighting as well as those not immediately affected by it.

Scientific Organization Lacking

"We see how fortuitous and casual our foreign trade has been, not merely in the time when it only meant 4 per cent of our production, but in the enormously increased exports brought about by the war. Of scientific organization for foreign trade we were, in our earlier years, throughout the war, and are even now, lacking. We see that we have created an enormous machine for production, not alone that in well-organized hands but all over the country; while our machinery for salesmanship and distribution to the foreign consumer requires further development in order to compete with countries which have been at war but can now increasingly compete with us in manufacture for the world's trade. The world's demand for manufactured articles is limited only by its purchasing power in credits, loans or the exchange of commodities. It is not merely that with scientific and broadly conceived organization we can develop a trade that will take up what we do not need at home, it is that we must devise such a plan of campaign, organizing for peaceful contest equipped with finance and transport, or we must be confronted with an overproduction unwieldy and beyond assimilation in this country.

Studying Effects of Expansion

"Briefly, the time is almost at hand, if indeed it is

not already here, when the effect of the great plant expansion that took place during the war will no longer be considered only by those who give special attention to such matters, but will be observable, and observed, by all our people. As Europe progresses toward her own recovery, and comes back into the full energy of production, that effect will be more and more evident. Some of the European countries have already made great strides toward recovery. It has been estimated that Belgium has attained 80 per cent of her normal productivity and, as the rapidly mounting figures of her exports testify, Great Britain is fast resuming her old form. The anticipation is by no means unduly optimistic that in the near future Europe will be in a position to begin making payments of interest, if not of principal, on the loans we have made to her.

Foreign Trade Two-sided

"But the fact has always to be borne in mind that foreign trade is at least two-sided, and that it can be successful only when both sides derive profit from it. Imports pay for exports, and we have a huge balance of exports to be paid for. We have no longer a great annual interest bill to meet in London; that has been replaced by an interest bill twice as large to be met in this country. Necessarily, a large part of this bill will be met with goods, and those goods will come into a market equipped industrially to produce much more than it can consume. There is, of course, always room for certain classes of imports; no country is capable of producing all that its people need and desire. We shall continue to sell large quantities of our products in the very countries of Europe which are deeply indebted to us. We shall be confronted, in a quite unmistakable way, with the fact that we are able to produce more than we can sell at home. We shall face, accordingly, such an urgency for foreign trade as we have never before experienced. For, either we shall find markets abroad for the surplus of our industrial productivity, or we shall cease to produce it, which is quite unthinkable. That way lie stagnation, unemployment and business reverses. But the world offers vast opportunities for American enterprise. Needs that have been restricted by jealous and discordant political policies, material development that has been checked by the insistence on narrow spheres of interest, will be governed in the future by a broader and freer conception of international co-operation than has ever prevailed before. It is at least possible to cherish the belief that railroads will be built with a single eye to their commercial value and not to their place in military strategy; that the wealth producing industries which follow in the wake of the railroad will spread throughout long stagnant regions of the earth.

Rebirth of Civilized World

"There can be no question about the economic rebirth of the civilized world, for it is already in progress even in places where industrial distress seems most acute and social disorganization most profound. Vast undeveloped portions of the world with fertile soil and cheap labor are entering upon a period of rapid development. They will help supply the rapidly increasing needs for foodstuffs and raw materials, and they will at the same time furnish new markets for finished products. We may not be able to tell the precise extent or fix the exact direction of the forces that are about to change the face of the world, but we may face the future with confidence by the exercise of an intelligent foresight and by being ready to adjust ourselves to the new course of economic development. We must devote the same sustained and intelligent effort to international commerce that has produced such wonderful results in our domestic trade.

"The development of our industrial productive capacity during the war, coupled with the change in our national financial status, might, if unintelligently handled, be the forerunner of distress. But if it only be handled with intelligence, energy and courage, there lies in it a vastly greater potentiality for general benefit through foreign trade."

SUPPLIES OF FERROMANGANESE

Output in First Quarter Shows Increase—Available Supply—Large Gain in Spiegeleisen

Production of ferromanganese and spiegeleisen during the first quarter of 1920 has been at a better rate than in 1919, but is still considerably below the war rate of production. The total to April 1, 1920, has been 87,270 gross tons, or 29,090 tons per month, as compared with 20,732 tons per month in all of 1919, according to the blast furnace reports of THE IRON AGE.

The greatest increase has been in spiegeleisen, the March output being nearly three times the January production, and the average for the quarter being 11,040 tons per month as against only 5449 tons per month in all of 1919.

The following table gives the production of ferromanganese and spiegeleisen for the first quarter of 1920, and a comparison with some recent years:

Ferromanganese and Spiegeleisen Output in the United States in Gross Tons

	Ferromanganese	Spiegeleisen	Total	Average Per Month
January, 1920	18,062	5,895	23,957	.....
February, 1920	16,283	11,755	28,038	.....
March, 1920	19,803	15,472	35,275	.....
Total, first quarter, 1920	54,148	33,122	87,270	29,090
Total, 1919	179,079	65,391	244,470	20,732
Total, 1918	345,306	249,002	594,308	49,525
Total, 1916	208,389	197,518	405,907	33,817
Total, 1914	106,083	100,365	206,448	17,204
Total, 1913	119,495	126,081	245,576	20,464
April, 1920	21,028	6,600	27,628	.....

The monthly output of ferromanganese to April 1, this year, has been 18,049 tons per month, which compares with 14,923 tons per month in all of 1919 and 28,775 tons per month in 1918, the record year. The April output this year was 21,028 tons, a feature under the conditions ruling in the industry because of labor troubles.

Available Supplies of Ferromanganese

The available supplies of ferromanganese for the first quarter of 1920 as compared with other periods are as follows in gross tons, as obtained from an analysis of the output, imports and exports:

	Output	Imports	Exports	Available Supply
January, 1920	18,062	2,771	..	20,833
February, 1920	16,283	2,939	27	19,195
March, 1920	19,803	2,860	75	22,588
Total, first quarter, 1920	54,148	8,570	102	62,616
Aver. per month, first quarter, 1920	18,049	2,857	34	20,872
Aver. per month, 1919	14,923	2,752	255	17,420
Aver. per month, 1918	28,775	2,264	298	30,741
Aver. per month, 1917	21,486	3,703	776*	25,413
Aver. per month, 1915	12,021	4,605	...	.....
Aver. per month, 1913	9,958	10,672	...	.....
Five-yr. aver., 1910-1914	8,280	8,399	...	.....

*Last half only.

Imports of ferromanganese, all from Great Britain, are increasing, having been 2857 tons per month in the first quarter of this year against 2752 tons per month in all of 1919. They are still much less than the pre-war imports.

Available supplies thus far this year are larger than in 1919, having been 20,872 tons per month to April 1, against 17,420 tons per month in all of 1919.

Supplies of Manganese Ore

Imports of manganese ore in the first quarter of 1920 have been as follows in gross tons as compared with other periods:

Manganese Ore Imports in Gross Tons

	Total	Average Per Month
January, 1920	21,463	.....
February, 1920	4,106	.....
March, 1920	18,970	.....
Total, first quarter, 1920	44,539	14,846
Total, 1919	333,344	27,779
Total, 1918	491,303	40,942
Total, 1917	629,972	52,498
Total, 1915	320,784	26,732
Total, 1913	345,084	28,757

Manganese ore imports have fallen off decidedly. The foregoing data show only 14,846 tons per month

for the first quarter or the lowest average in the last seven years.

British Supplies of Manganese Ore

Receipts of manganese in Great Britain continue to show a decline as compared with the pre-war and war periods. The ferromanganese industry in that country is closely related to the American steel industry because of our dependence on certain imports from that country, and for this reason the following table of British ore import statistics is given:

British Imports of Manganese Ore in Gross Tons

	Total	Average Per Month
January, 1920	33,216	.....
February, 1920	25,252	.....
March, 1920	34,177	.....
Total, first quarter, 1920	92,645	30,881
Total, 1919	265,809	22,150
Total, 1918	365,606	30,467
Total, 1917	331,264	27,605
Total, 1915	377,324	31,443
Total, 1913	601,177	50,098

These data show an improvement thus far in 1920, the monthly average to April 1 having been 30,881 tons per month against 22,150 tons per month for all of 1919. They are still much below the 1913 imports. The surprise, however, is that they are now larger than our own imports, or 30,881 tons contrasted with 14,846 tons per month to April 1, 1920.

Supplies and Needs in 1920

Not long after the United States entered the war it was officially estimated that the monthly needs of the steel industry were 28,000 tons of ferromanganese. This was based upon the use of 80 per cent alloy and a steel output of around 43,000,000 tons. The foregoing analyses show an average available supply of 20,872 tons per month in the first quarter of 1920. Assuming the 1920 steel output to be close to 45,000,000 tons based on the production in March, as revealed by the statistics of the American Iron and Steel Institute, and that 74 per cent of this is open-hearth steel with two-fifths of the Bessemer output absorbing spiegeleisen as high carbon steel, the following calculation gives the estimated amount of 80 per cent ferromanganese necessary this year at 17 lb. per ton of steel produced:

	Gross Tons
45,000,000 × .74	= 33,300,000 open-hearth steel.
45,000,000 — 33,300,000	= 11,700,000 Bessemer steel.
11,700,000 × 2/5	= 4,680,000 high carbon Bessemer steel.
11,700,000 — 4,680,000	= 7,020,000 low carbon Bessemer steel.
33,300,000 + 7,020,000	= 40,320,000 steel requiring ferromanganese.
40,320,000 × 17 = 685,440,000 lb.	= 306,000 ferromanganese necessary in 1920.

Adding to the above 306,000 tons the 10,000 tons estimated as needed in the iron foundry business, we have 316,000 tons of 80 per cent ferromanganese as necessary for the American steel industry's needs in 1920. To meet this total we have the probable available supply of 252,588 tons [(18,049 + 3000) × 12] based on the assumption that the 1920 monthly domestic output will be equal to that of the first quarter, and that the imports of British alloy will average 3000 tons per month. Allowing for the usual errors in an estimate of this kind and the use of spiegeleisen as a partial substitute, the apparent deficiency at the present rate of output is about 64,000 tons.

The last analysis of this nature, covering 1919, appeared in THE IRON AGE, Feb. 19, 1920. Similar reviews of the manganese-iron alloy situation appeared in THE IRON AGE Dec. 6, 1917; Jan. 31, 1918; April 11, 1918; July 25, 1918; Dec. 28, 1918; Feb. 20, May 15, Aug. 28 and Dec. 4, 1919.

Electric Furnace for Annealing Steel Castings

The Electric Furnace Construction Co., Philadelphia, announces the closing of a contract with the Emery Steel Co., Baltimore, Md., for an electric furnace of new design for annealing steel castings.

Finances and Transportation Discussed

American Iron, Steel and Heavy Hardware Association Also Considers Policy of Steel Companies in Distributing Products

THE almost hopeless condition of transportation throughout the country was the keynote of the speeches by members of the American Iron, Steel and Heavy Hardware Association, during the eleventh annual convention of the society at the Bellevue-Stratford Hotel, Philadelphia, May 4, 5 and 6. The first two days of the convention were given over to business of the organization and a tour of the plant of the Lukens Steel Co., Coatesville, Pa., where the members were shown the giant plate, 250 in. x 195½ in. x ¾ in., rolled by the Lukens company for a railroad firebox. The members who made the trip were guests of the Lukens Steel Co. at luncheon.

George W. Norris, governor of the Federal Reserve Bank in the Philadelphia district, during the open session of the convention, outlined the condition of the country before and since the institution of the Federal Reserve and the functioning of that institution during and since the war. In concluding Mr. Norris pointed out that the Federal Reserve financed the war and has prevented a post-war panic, but now it is up to every business man to see that the Federal Reserve is not brought to the point of exhaustion.

Frederick H. Payne, Greenfield Tap & Die Corporation, and president of the American Hardware Manufacturers' Association, also spoke on financial conditions in the country to-day, explaining briefly the operation of the First Federal Foreign Banking Association with which he has been connected since its inception. Formed as a financial assistance to the exporter or manufacturer interested in export, it is intended to provide larger commercial credits than usual to its stockholders, provide a market for notes and maintain a council of specialists whose duty is the solving of problems of the exporter. This first institution will endeavor to cover the Eastern part of the United States. Although Mr. Payne said he foresaw some relief from the tight money market during the summer, the fall will undoubtedly see higher prices and another tightening of money.

The seriousness of the transportation situation, the backbone of the industry, and the tremendous foreign demand that is to a large extent going unsatisfied, were dwelt upon by N. J. Clark, Lake Erie Bolt & Nut Co., and president of the Bolt, Nut and Rivet Institute. He was anything but optimistic in speaking of the present difficult labor situation and the shortage of material coupled with transportation conditions. Speaking of the shortage of small sizes in bolts, he pointed out that the bolt wire manufacturers find it exceedingly difficult to hire wire drawers. In nut steel, said Mr. Clark, manufacturers are from six months to a year behind in filling orders because of shortage of material, and there is but slight relief in sight, particularly in sizes under ¾ in. With from 25 to 50 per cent of the machines in plants down from lack of labor and material, there is no prospect of a decrease in prices.

Although not listed to speak, S. D. Latty, Kirk-Latty Mfg. Co., Cleveland, was asked to express his opinion of the present situation. "It is an accepted fact," said Mr. Latty, "that the automobile industry is going at high speed and paying any price for labor to keep plants in operation. It gets the material because it pays the price, and I can see no recovery unless we have a depression and a letting down of present conditions."

Another unlisted speaker, who was asked to address the convention, was T. H. Taylor, of the American Steel & Wire Co. Mr. Taylor said that production of the American Steel & Wire Co. was high, pointing out that in February of this year the production was 146,000 tons; in March, 183,000 tons, and in April the company shipped more than 200,000 tons. Undoubtedly the biggest year in the history of the company might have been the result "had they let us alone," but the

railroad situation is having the effect of throttling production. As an example of the difficulties they are facing in moving material Mr. Taylor mentioned that recently 1580 cars were requested from the railroads to move about 40,000 tons of material, and they received about 200. In filling orders from customers Mr. Taylor explained that the American Steel & Wire Co. rations each one, giving him what he needs, not what he wants, and referring back to orders from each man for a period covering in some cases 25 years, to find what his average purchases have been. He said that he knew all jobbers want to replenish their depleted warehouses, but under present conditions this is impossible, and so the company has concentrated on trying to fill immediate needs, not wants. Mr. Taylor said that the shortage of material among retailers is not as acute as is generally believed, basing his statement upon a recent canvass of retailers by about 50 salesmen of the American Steel & Wire Co., who found that retailers ordering 25 kegs of material were usually allotted about five kegs by the jobber and consequently, to obtain the material, repeated the order with different jobbers.

S. D. Latty, the previous speaker, replying to Mr. Taylor's assertion that the American Steel & Wire Co. was filling present needs, said that any time Mr. Taylor would come to his plant he would show him more than 25 per cent of his machines down from lack of material and that he had been doing business with the company for 25 years. Mr. Taylor replied that the company was doing the best it possibly could under present conditions, and in most cases felt that it was satisfying the needs of the customer.

Officers of the association for the coming year, elected at the final session of the convention, were: E. J. McCarthy, Beals, McCarthy & Rogers, Buffalo, president; Andrew Wheeler, Morris, Wheeler & Co., Philadelphia, first vice-president; William L. Miekant, Beck & Corbett Iron Co., St. Louis, second vice-president. Members elected to the executive committee are: J. B. Carse, Ogden & Wallace, New York; J. I. Stephenson, Cincinnati Iron & Steel Co., Cincinnati; C. W. Henderson, Jr., Arthur B. Harvey Co., Boston; Roy Hall, Inland Iron Co., Fresno, Cal.; H. A. Lockwood, Edgar T. Ward's Sons Co., New York, and C. R. Williams, Williams Hardware Co., Minneapolis, Minn.

Steel Corporation's Orders Again Increase

Unfilled orders on the books of the United States Steel Corporation, April 30, were 10,359,747 tons, compared with 9,892,075 tons on March 31. This is an increase of 467,672 tons, against one of 389,994 tons in March, 216,640 tons in February and 1,020,075 tons in January. It is the twelfth consecutive monthly increase shown by the corporation. Never before in peace time has the corporation had so much unfilled business on its books as it has to-day. The unfilled tonnage a year ago was 4,800,685 tons or 5,559,062 tons less. The table below gives the unfilled tonnage at the close of each month beginning with January, 1917:

	1920	1919	1918	1917
Jan. 31.....	9,285,441	6,684,268	9,477,853	11,474,054
Feb. 28.....	9,502,081	6,010,787	9,288,453	11,576,597
March 31.....	9,892,075	5,430,572	9,056,404	11,711,644
April 30.....	10,359,747	4,800,685	8,741,882	12,183,083
May 31.....		4,282,310	8,337,623	11,886,591
June 30.....		4,892,855	8,918,866	11,382,287
July 31.....		5,578,661	8,883,891	11,844,164
Aug. 31.....		6,109,103	8,759,042	10,407,049
Sept. 30.....		6,284,638	8,297,905	9,833,477
Oct. 31.....		6,472,668	8,353,293	9,009,675
Nov. 30.....		7,128,330	8,124,663	8,897,106
Dec. 31.....		8,265,366	7,379,172	9,381,718

The largest total of unfilled orders was on April 30, 1917, when it was 12,183,083 tons; the lowest was on Dec. 31, 1910, when the total was 2,605,747 tons.

ESTABLISHED 1855

THE IRON AGE

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Price Relations and Stability

When it was first proposed, early in American participation in the war, that the Government should fix prices, there was a great deal of opposition. It was sagely argued that the proposition was impractical, because reasonable prices could not be determined by theory. The Government would get skelp too high, or galvanized sheets too low, or the spread between billets and sheet bars would be wrong. Of course there were thoughtful men who insisted that a group of steel men selected for their knowledge of the different branches of the industry could formulate a complete schedule of prices in a couple of hours, harmonious and in keeping with conditions, if only a basis price for some leading commodity were set as a foundation.

It was not difficult to see that it was the principle of the thing, rather than the prospective results, that was objected to. Men do not like to be controlled. It was amusing, in the light of the gravely offered objections, to compare the orderly and consistent price structure evolved by the steel producers under direction of the Government with the incongruities that had existed in the price structure before the control was established, and it is still more amusing to make the comparison with the bizzare market that now obtains. It is an altogether unprecedented situation that there should be as many as two markets for steel products, yet of late there have been even more than two. In addition to this peculiarity of the situation, there are various relations between prices of different commodities that are distinctly irrational. Yet there is no great amount of complaint. The conditions are accepted chiefly because no one produced them, and hence there is no one to blame.

The fact that present conditions and prices are accepted should not be taken as assurance that prices or price relations are to continue indefinitely as they are. Before the war there was distinctly a more stable market, and certainly a more harmonious price structure. Yet even then there were remarkable fluctuations, some of them rather unexpected. To mention a few illustrations taken at random, for the season of 1890 Lake

Superior Bessemer ore was advanced \$1 per ton, and Bessemer pig iron declined 40 per cent during the year. For 1910 the ore advance was 50 cents and the pig iron decline in the year was 21 per cent. The year was one of continued activity, yet Connellsville coke for prompt shipment declined about 45 per cent, opening at \$2.75 and closing at \$1.50. There was a very fair degree of business activity in March, 1912, yet a year later, when prospects were not really as good, the billet market was almost 50 per cent higher. During the last four months of 1916, pig iron advanced by about 65 per cent, yet the buying movement that caused the advance was started by price cutting.

All commodity prices are particularly sensitive at this time. The stability imparted by the war control is entirely lost. This is largely psychological, and is not entirely out of relation with the fact that many ex-soldiers enjoy staying up late at night much more than they did before they were "trained" to observe regular hours.

Urgent Need of Foreign Trade

President Farrell, in his address at the Foreign Trade Convention at San Francisco, Wednesday, impressed upon his hearers very forcibly the importance of the United States becoming a greater exporting nation. Realizing that often the building of great plants overshadows the operations of small companies, Mr. Farrell called attention to the fact that one of the striking features of the war period was the wonderful growth of small companies. Referring to the State of Ohio as a huge workshop in which plants not yet enumerated were added to the producing capacity, he said that the census soon to be announced will disclose with reasonable accuracy the full extent of the marvelous industrial changes which have taken place, but it is already apparent that the manufacturing capacity of the country has been immensely increased and that a large percentage of the output must be exported. "We shall be confronted," he said, "with the fact that we are able to produce more than we can sell at home. We shall face accordingly such an urgency for foreign trade as we have never before experienced."

for either we shall find markets abroad for the surplus of our industrial productivity, or we shall cease to produce it, which is unthinkable. That way lies stagnation, unemployment and business reverses."

Mr. Farrell does not, however, take a pessimistic view of the situation. He believes that "jealous and discordant political "policies" must be discouraged and a broader and larger conception of international co-operation must be adopted. He is of the opinion that we can at least cherish the belief that railroads will be built with a single eye to their commercial value and not to their place in military strategy, and he might have added that the optimistic will hope that the railroads will be built without any plans for financial strategy.

Mr. Farrell, naturally and very properly, has little patience with a policy which provides for taking care of foreign trade only when it is convenient to do so and when domestic demand declines. He insists that the efforts to extend trade must be sustained and intelligent, which means that spasmodic efforts to create foreign trade cannot be tolerated. He points out that the development of our industrial capacity during the war may cause serious distress later unless the situation is handled with intelligence, energy and courage. But he does not despair, for he believes that, if so handled, the benefit of foreign trade will indeed be greater than ever before enjoyed.

The address covered the situation in general, other speakers devoting themselves more to the details of what has been accomplished and what may be done to promote foreign commerce. The Webb-Pomerene act received some attention, and, while it was conceded that this measure is a venture in a new direction, and has not accomplished all that its enthusiastic advocates hope for, it has helped in making real progress in several ways, especially in enabling the smaller manufacturers to market their products abroad, but this act even when perfected cannot accomplish all that will be necessary in order to increase American exports adequately. The narrow political policies to which Mr. Farrell referred must be abandoned and broad policies must be adopted. This does not mean that the historic American policy of production must be given up, but it does mean that new policies must be enacted after giving most careful consideration to the changes which the World War has wrought in economic conditions.

There is a belief in many quarters that the unauthorized strike of the railroad switchmen will cause a feeling of resentment on the part of many workingmen who have been thrown out of employment and will be anxious to experience a prolonged period of uninterrupted work. Hence, it is thought that these men who have been forced into idleness will not be disposed to become strikers. It is pointed out, however, that inefficiency of labor is still retarding production. One of the largest producers in the Youngstown district recently carried out a vigorous policy to improve the efficiency of his working force. In one day, 30 workers in the steel plant were dismissed with the un-

derstanding that they could apply at the employment office and be assigned to other positions in the works. This weeding-out process has, it is said, already produced desirable results and is to be continued, including office workers as well as men in the mills. It resulted in decreasing costs of production and improving the morale of the workers who were undisturbed. The plan is likely to be adopted elsewhere and certainly is better than the policy adopted by some manufacturers of importing workers from distant points.

Seasonal Coal Freight Rates

Inasmuch as it is no new experience to find a proposed "reform" to look well at first glance and prove unattractive upon careful investigation, thoughtful men are indisposed to favor the proposal that seasonal freight rates on coal be established, as is contemplated by Senator Frelinghuysen, without careful consideration of all facts that can be made available. It is desirable in the interests of everyone concerned that the movement of coal be uniform throughout the year, but the testimony at the hearings on the Frelinghuysen proposal showed that there was much conflict of interest. The double change recently made in the plan, whereby a straight percentage reduction for part of the year with a corresponding percentage advance for the remainder of the year was replaced by a graduated scale of reductions and advances per ton, suggests how such a plan may be inadequately conceived.

There are certain propositions that seem to be assumed when they need to be proved absolutely. One is that the ability to produce coal is greater in summer than in winter. It is true the miners in the recent wage scale controversy laid stress upon figures indicating that coal miners do not work steadily during the year, but it is not certain that what miners want is steady employment. What they demanded was a shorter work day and a higher rate per ton. There was little, if any, evidence produced to show what miners do when they are not mining coal, but it is well known that no small proportion of the miners work on farms and on roads in summer and engage in various descriptions of outside work. Such opportunity is entirely lacking in winter. Thus it is unsafe to assume that the only thing necessary to have more coal mining done in summer is to offer miners the additional opportunity to work in the mines. One is dealing with men and the attitude and circumstances of the men should be studied thoroughly before a conclusion is reached.

The other assumption that needs to be scrutinized is that railroad facilities are overstrained in winter and insufficiently engaged in summer. There are large seasonal movements of freight, in building material, road material, farm products, etc., that are distinctly summer and not winter movements. The seasonal surplus of railroad capacity needs to be investigated, but of course only after it has been found to exist. There are claims on the part of railroads in some sections that there is no surplus at all.

So much for general assumptions that require

study rather than appeal to first impressions. There are special cases that need consideration. There is the case of the Lake coal shipping districts. As to the Pittsburgh coal district at any rate it has been shown by the statistics of the past few years that as matters stand the production is actually greater in summer than in winter, and this may be found true of Ohio and West Virginia. Then there is the peculiar case of the Iowa operators, who say that their coal cannot be stored, and that if the Frelinghuysen proposition is adopted, their mines will be largely or wholly closed during the summer, the demand going to Illinois.

Beyond the considerations just referred to, there is the great matter that this is purely a practical question, i. e., one of practice. It is a business matter. It is a question of what men will do. One can lead a horse to water but he cannot make him drink. Were the seasonal coal rates put into effect, would buyers and sellers act according to the theory that has been formed, or would they from time to time take all available information into consideration? The buyer of coal does not have before him the average monthly price of coal for the five years past and the five years to come. Fluctuations in the price of coal may easily be more violent than the artificial fluctuations proposed in the delivered cost, made by varying the freight rates. In summer the buyer may feel that prices are too high and are likely to be lower in the fall by a greater amount than the difference in freights. Such a consideration is particularly in point at this time. The variations in coal prices that used to occur were considered somewhat violent, but they were nothing to variations now possible. As a matter of business, there is room for very serious doubts whether buyers and sellers would act in accordance with the theory upon which the Frelinghuysen proposal is based.

The Manganese Situation

Two features mark the situation in ferromanganese as discussed in detail elsewhere in this issue. One is the increase in output in April over any other month this year, despite the large decrease in the April pig iron output because of the railroad strike. Last month 21,028 tons were produced against 19,803 tons in March and an average of 18,049 tons per month in the first quarter.

The other feature is the striking decline in manganese ore imports. For the first quarter these have been only 14,846 tons per month, or at a lower rate than for any year in the last seven. Unless there is a decided improvement the industry will be in a serious position. In contrast to the American situation is the betterment shown in Great Britain where the ore imports to April 1, this year, have been 30,881 tons per month, as against 22,150 tons per month in all of 1919.

The statistics of the American Iron and Steel Institute for March showed that the rate of steel output was over 45,000,000 tons per year. While this was probably cut down in April, it is reasonable to presume that it will approach a rate of 44,000,000 tons in May and perhaps be maintained

the greater part of the year. Assuming this to be true, there will be theoretically needed 308,400 tons of ferromanganese during 1920, or 25,700 tons per month. At the present rate of domestic output combined with the import rate, the monthly available supply is only 20,872 tons per month as judged by the data for the first quarter. It will thus be seen that our estimated supply is running about 5000 tons per month behind theoretical needs.

While there is no occasion yet for alarm, it is advisable to conserve the use of ferromanganese as much as possible. There are probably large stocks of ore on hand or our present output would not show the increase it does. There is very little promise of an increase in the supply of alloy from Great Britain, despite an improvement there in the ore situation. These facts again emphasize the need of a more serious consideration of the pre-melting of ferromanganese by the electric or some other process. Its economy has been demonstrated in European practice but its adoption in American plants has not yet developed.

How the railroad strike affected pig iron output by districts is shown by the April statistics of THE IRON AGE. The largest decreases were in the Shenango and Mahoning valleys; the April production was 50 per cent less than in March in the one case and 45 per cent in the other. In the Pittsburgh district, where the heavy output obtains, the decline was only about 14 per cent. In the Chicago district, the second largest, the decrease from the March output was about 28 per cent. In the Lehigh Valley, the Western Pennsylvania, and the Alabama districts there was only a slight loss in production, while in the New Jersey, the lower Susquehanna and Lebanon Valley and the Tennessee districts a substantial increase over March was recorded.

Death of John Wesley Hyatt

JOHN WESLEY HYATT, inventor of the roller bearing which goes by his name, died suddenly May 10 at his home in Short Hills, N. J., at the age of 83. He perfected the roller bearing in 1892 and a factory was built at Harrison, N. J., for its manufacture. In all he obtained over 250 patents, including a sewing machine capable of sewing 50 rows of lock stitches at once, now used for making machine belting; also a machine for cold-rolling the rods used in machinery shafting. He was also the inventor of celluloid and was awarded the Perkin medal in 1914 by the Society of Chemical Industry.

Eastern Rolling Mill Co. Operations

The Eastern Rolling Mill Co., Baltimore, is planning to inaugurate operations at its new plant on Baltimore Street on May 17, commencing with six hot mills, intermediate and finishing departments. It is planned to place the other six hot mills in service about June 15, with construction of these buildings now nearing completion. The plant will specialize in the production of high grade steel sheets for automobile body manufacture and other utility. The present capacity will average 60,000 tons a year and it is proposed to increase this materially at an early date. The company's site totals 22 acres at the present time, and options have been secured on 25 acres adjoining for the contemplated expansion. The initial plant covers an area about 375 x 1000 ft. and will give employment to about 1200 men. The company is capitalized at \$5,000,000. J. M. Jones is president and plant manager.

MORE RAILS SOLD

Government Obtains Higher Prices Than for Previous Tonnage

WASHINGTON, May 11.—With the exception of a small quantity which brought higher prices, the bulk of the 62,490 gross tons of 80-lb. steel rails recently advertised for sale by the War Department has been sold for \$45 and \$46 a ton. This is a better price than was obtained when similar rails, totaling 57,100 tons, were sold some time ago for \$40 a ton. The rails are those which were obtained originally for use in France and are not suited for American railroads. It is assumed that most of the rails just sold by the War Department will be resold by the purchasers for export.

The entire lot of rails and accessories, on which bids were opened by the Army Engineers on May 3 and on which awards have just been made, brought a total of \$3,544,606.84. Included in addition to the 80-lb. rails were 167,239 pairs of splice bars and considerable quantities of track bolts, spikes, tie plates, rail braces, switch stands and turnouts. There also were offered seven gross tons of 70-lb. rails, 10 gross tons of 40-lb. rails and 700 gross tons of undrilled 80-lb. rails.

The largest purchaser was the Hyman-Michaels Co., Chicago, which bought 47,367 tons of the 80-lb. rails at \$46.05 a ton; 126,812 pairs of splice bars at \$2.15 per cwt.; 3199 kegs of track bolts at \$3.90 per cwt.; 15,603 kegs of track spikes at \$3 per cwt.; 200 switch stands at \$10 each and 200 turnouts at \$75 each. The total for this company amounted to \$2,459,531.76.

P. R. Phillips & Sons Co., Philadelphia, bought a quantity of material totaling \$295,922.55. This included 5000 gross tons of the 80-lb. rails at \$45.35 a ton and various accessories.

The Godwin Construction Co., New York, bought 3850 tons of 80-lb. rails at \$48.75 per ton, and other materials, paying a total of \$213,622.19. The Aluminum Co. of America, New York, bought 3373 tons of 80-lb. rails at \$50 a ton and miscellaneous accessories, totaling \$195,403.19. The U. S. A. International Corporation, Pittsburgh, bought rail braces, switch stands and turnouts for which it paid \$173,217.94. The Norfolk Southern railroad paid \$46.56 for 2750 tons of 80-lb. rails, its purchases totaling \$151,708.36.

The undrilled 80-lb. rails brought \$43.50 a ton while the 60-lb. rails brought \$48.86 a ton, the former being bought by the Phillips company and the latter by Samler Bros., Inc. The largest amount paid for the 80-lb. rails, drilled, was by the Department of Public Utilities, Richmond, Va., which bought 60 tons at \$55 a ton.

Other companies which made purchases were: Bethlehem Steel Corporation, \$23,055; Chicago Great Western Railroad, \$2,000; Maryland & Pennsylvania Railroad, \$6,434; Richardson & Co., \$2,048.80, Pittsburgh; Samler Bros., Inc., \$11,237.80, and Track Specialties Co., \$5,097.95.

O. F. S.

Wages of Sheet Mill Workers Advanced

YOUNGSTOWN, May 11.—Wages of sheet mill workers will be advanced 12 per cent for the May-June period over the March-April rate, while there will be no change for tin mill employees. The bi-monthly examination of sales sheets was conducted May 10 at Scranton, Pa., where the Amalgamated Association of Iron, Steel and Tin Workers is in convention.

Average invoiced selling price of Nos. 26, 27 and 28-gage black sheets shipped in March and April was found to be \$5.05 per 100 lb. compared with \$4.65 at the previous examination, or an eight-point advance. The tonnage rate increases $1\frac{1}{2}$ per cent for each 5c. per 100 lb. advance in selling price of sheets. Under the new rate, sheet workers are paid 87 per cent above the base.

The examination revealed an average invoiced selling price for tinplate of \$7.40 per base box, the same as two months before. Tin mill operatives are now paid 78 per cent above the base.

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INGOT OUTPUT ONE-SIXTH OFF

About Same Reduction in April Steel Production as in Pig Iron

The American Iron and Steel Institute's statistics of steel ingot production in the United States for April show a reduction of 17 per cent from the record figures of March. THE IRON AGE pig iron production figures for April showed a reduction of 16 per cent from the daily iron output in March. The 30 companies reporting to the Institute (companies which made about 84 per cent of the steel ingot production in 1918) had a total output in April of 2,638,305 gross tons. Counting 26 working days, this represents 101,473 tons per day. If the remaining 16 per cent produced at a corresponding rate, the total output for the country for April was 3,139,710 tons, or 120,760 tons per day. The steel ingot production of the first four months of 1920 appears to be 14,000,000 tons.

The figures below, from the monthly reports of the American Iron and Steel Institute, show the distribution as between Bessemer and open-hearth steel. Ingot statistics were not gathered in September, 1919, when the steel strike began, or in the three months following:

Monthly Production of Steel Ingots of Companies Producing 84.03 Per Cent of Total in 1918—Gross Tons

	Open Hearth	Bessemer	All Other	Total
January, 1919...	2,351,153	749,346	7,279	3,107,778
February.....	2,043,635	655,206	5,842	2,704,683
March.....	2,100,528	555,332	6,405	2,662,265
April.....	1,732,447	500,770	6,494	2,239,711
May.....	1,506,015	414,392	8,617	1,929,024
June.....	1,692,257	521,634	5,328	2,219,219
July.....	1,875,630	625,246	7,300	2,508,176
August.....	1,988,651	748,212	9,218	2,746,081
January, 1920..	2,242,758	714,657	10,637	2,968,102
February.....	2,152,106	700,151	12,667	2,865,124
March.....	2,487,245	795,164	16,640	3,299,049
April.....	2,056,336	568,952	13,017	2,638,305

Iron and Steel Markets

BUYING SUSPENDED

Concentration All on Shipments

Ingot Production One Sixth Off From March— Strike on Steel Corporation Road

Seldom, if ever, have iron and steel consumers so generally suffered from a lack of material as at the present time. That factory and foundry operations are heavily curtailed or shut off altogether without loud cries of complaint or protest is explained by a realization that mills are not to blame for the railroad strike and that if manufactures cannot be shipped it is not surprising that raw materials are not received. A waiting attitude is taken toward the transportation crisis as marking an important transition in the deflation movement, however prolonged this may be.

The result is that buying and selling are quite secondary to the effort to get freight moved. The situation, on the whole, is no worse than a week ago. Whereas the pinch is felt more remotely from the producing of raw materials of manufacture, activity at some mills has been bettered while in others new complications have developed. Outstanding is the strike on the Bessemer & Lake Erie, the Steel Corporation's ore carrying road to Pittsburgh plants. If at all prolonged, Pittsburgh's present scale of operations, 65 to 70 per cent of capacity, will be greatly reduced. Already ore boats are tied up at lower Lake docks, unable to unload, and in the light of the late opening of Lake navigation the industry may face an inadequate ore supply later in the year.

It is estimated that 1,000,000 tons of finished steel is loaded on cars not being moved and stored in works and mill yards. At least half of this represents products of the Steel Corporation. A leading independent company on Monday had 108,000 tons of finished material stored; another 70,000 tons and several department shutdowns are chargeable to the clogging up of works by the accumulations. Tuesday some improvement in shipping was made in Youngstown, which has been hard hit, pig iron production there in April, for example, being about half of the March output.

In Chicago the Steel Corporation has now 21 blast furnaces active out of 29 and its operations are at a rate of fully 80 per cent of ingot capacity. The leading independent there has maintained a 70 per cent operation.

Proficiency in managing traffic is being tested. Through and circuitous train routings, long as well as short hauls by means of motor trucks, and many combinations of these have marked the intensive effort to meet the transportation situation. Fuel scarcity has commonly been a major factor. One Eastern plate mill has lately not been able to get over 50 per cent of its normal production. One sale of spot Connellsville coke brought \$14 at the ovens and as high as \$15.50 has been offered by foundries.

A sale of 1000 tons of foundry iron to Germany,

the first for years, has been made. Other moderate lots for foreign shipment are reported. The only notable domestic inquiry is for 20,000 tons of basic for a St. Louis plant for last half shipment. The trouble, of the foundrymen, due to the railroad strike, continue and to them is added in some cases financial strain owing to inability to make shipment of castings. In the Chicago district, molders of 32 jobbing foundries are on a strike. Prices continue firm and foundry irons in the Pittsburgh district have advanced \$1.

The statistics of ingot production for April indicate a total for the country of 3,139,710 tons, or 120,760 tons per day, which is a reduction of about one-sixth from the March output of 145,000 tons daily. The drop in steel making is thus practically the same as that for pig iron, the April daily iron output average being 16 per cent less than that of March. In the four months of this year the country has apparently produced 14,000,000 tons of ingots.

Notable improvement was made in sheet mill operations, the leading interest running now at about 80 per cent and independent mills at 60 to 70 per cent, except in the Youngstown district, where substantially nothing is being produced. The leading independent in Chicago in allocating its third quarter output found that it was able to take care of only 50 per cent of the needs of its customers.

About 70,000 tons of 80-lb. rails, including accessories, have been sold by the Government. On 50,000 tons \$46.05 per ton was paid.

Railroad car purchases, totaling 3600, were chiefly for repairs or for car bodies. The Bethlehem Steel Co. also bought 1000 cars and the Havana Central 500. Fresh car inquiries total about 2000.

The largest structural lettings include 4200 tons for a smelter in Arizona and 2500 tons for a building in Topeka, Kan. Much of the business for delivery through the third quarter is going for 3.25c., Pittsburgh, and upwards on shapes and 3.50c. and upward on plates, but special prices are still noted, especially a quotation by an Eastern shape mill of 2.75c., Pittsburgh, on 1000 tons for shipment in 60 days.

For export a sale of 5000 tons of billets for May and June was made by a Cleveland mill at \$75. Prices in England have again been advanced. Foundry and forge iron is up \$3.50 per ton; beams, \$3.85; billets, \$3.85, and sheets, \$13.50 to \$15.50 per ton.

Pittsburgh

PITTSBURGH, May 11.

Careful investigations and reliable information secured from traffic managers of leading steel companies in the Pittsburgh district show that the railroad strike situation, on the whole, is not any worse than one week ago. In some ways it is better, while in others it is not so good.

Taking the three leading railroads serving the Pittsburgh district, the Pittsburgh & Lake Erie is in worse shape than the two others. This road has been practi-

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	May 11, 1920	May 4, 1920	Apr. 13, 1920	May 13, 1919
No. 2 X, Philadelphia...	\$47.05	\$47.05	\$47.05	\$31.90
No. 2 Valley furnace...	44.00	43.00	43.00	26.75
No. 2 Southern, Cin'tl...	45.60	45.60	43.60	30.35
No. 2 Birmingham, Ala...	42.00	42.00	40.00	26.75
No. 2 furnace, Chicago*	43.00	43.00	43.00	26.75
Basic, del'd, eastern Pa...	44.80	44.80	44.80	29.65
Basic, Valley furnace...	43.00	43.00	42.00	25.75
Bessemer, Pittsburgh...	43.90	43.90	43.40	29.35
Malleable, Chicago*	43.50	43.50	43.50	27.25
Malleable, Valley	44.00	43.00	43.00	27.25
Gray forge, Pittsburgh...	43.40	42.40	42.40	27.15
L. S. charcoal, Chicago...	57.50	57.50	57.50	38.85

Rails, Billets, Etc., Per Gross Ton:	May 11, 1920	May 4, 1920	Apr. 13, 1920	May 13, 1919
Bess. rails, heavy, at mill...	\$55.00	\$55.00	\$55.00	\$45.00
O-h. rails, heavy, at mill...	57.00	57.00	57.00	47.00
Bess. billets, Pittsburgh...	60.00	60.00	60.00	38.50
O-h. billets, Pittsburgh...	60.00	60.00	60.00	38.50
O-h. sheet bars, P'gh...	80.00	80.00	80.00	42.00
Forging billets, base, P'gh...	80.00	80.00	80.00	51.00
O-h. billets, Philadelphia...	64.10	64.10	64.10	42.50
Wire rods, Pittsburgh...	70.00	70.00	70.00	52.00

Finished Iron and Steel.

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia...	4.25	4.25	4.25	2.595
Iron bars, Pittsburgh...	4.25	4.25	4.25	2.35
Iron bars, Chicago...	3.75	3.75	3.75	2.50
Steel bars, Pittsburgh...	3.75	3.75	3.75	2.35
Steel bars, New York...	4.02	4.02	4.02	2.62
Tank plates, Pittsburgh...	3.75	3.75	3.75	2.65
Tank plates, New York...	4.02	4.02	4.02	2.92
Beams, etc., Pittsburgh...	3.10	3.10	3.25	2.45
Beams, etc., New York...	3.27	3.27	3.52	2.72
Skelp, grooved steel, P'gh...	2.75	2.75	2.75	2.45
Skelp, sheared steel, P'gh...	3.00	3.00	3.00	2.65
Steel hoops, Pittsburgh...	5.00	5.00	4.00	3.05

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	May 11, 1920	May 4, 1920	Apr. 13, 1920	May 13, 1919
Sheets, black, No. 28, P'gh...	5.50	5.50	5.50	4.35
Sheets, galv., No. 28, P'gh...	7.00	7.00	7.00	5.70
Sheets, blue an'd, 9 & 10...	4.50	4.50	4.50	3.55
Wire nails, Pittsburgh...	4.00	4.00	4.00	3.25
Plain wire, Pittsburgh...	3.50	3.50	3.50	3.00
Barbed wire, galv., P'gh...	4.45	4.45	4.45	4.10
Tin plate, 100 lb. box, P'gh...	\$7.00	\$7.00	\$7.00	\$7.00

Old Material, Per Gross Ton:

Carwheels, Chicago...	\$37.00	\$37.00	\$37.00	\$21.00
Carwheels, Philadelphia...	40.00	40.00	40.00	22.00
Heavy steel scrap, P'gh...	25.00	25.00	25.50	14.50
Heavy steel scrap, Phila...	23.50	24.00	24.00	15.00
Heavy steel scrap, Ch'go...	23.00	23.00	23.50	15.25
No. 1 cast, Pittsburgh...	32.00	32.00	33.00	17.00
No. 1 cast, Philadelphia...	38.00	38.00	38.00	21.50
No. 1 cast, Ch'go (net ton)...	37.50	37.50	37.00	19.50
No. 1 RR, wrot, Phila...	34.00	34.00	35.00	21.00
No. 1 RR, wrot, Ch'go (net)...	26.50	26.50	27.00	15.25

Coke, Connellsville.

Per Net Ton at Oven:

Furnace coke, prompt...	\$11.00	\$11.00	\$10.00	\$3.50
Furnace coke, future...	11.00	11.00	10.00	4.00
Foundry coke, prompt...	12.00	12.00	11.00	4.25
Foundry coke, future...	12.00	12.00	11.00	4.75

Metals.

Per Lb. to Large Buyers:

	Cents	Cents	Cents	Cents
Lake copper, New York...	19.00	19.25	19.50	16.00
Electrolytic copper, N. Y...	19.00	19.25	19.25	15.75
Spelter, St. Louis...	7.80	7.95	8.40	6.05
Spelter, New York...	8.15	8.30	8.75	6.40
Lead, St. Louis...	8.15	8.40	9.00	4.60
Lead, New York...	8.50	8.75	9.25	4.95
Tin, New York...	56.25	60.25	63.25	72.50
Antimony (Asiatic), N. Y...	10.00	11.00	11.00	6.75

The above prices are for domestic delivery and do not necessarily apply to export business.

cally closed since the strike started, and on Monday its shopmen went out on a sympathy strike, but this did not put this road in any worse shape than it was before. This railroad is now breaking in green crews of switchmen and other employees at its McKeesport, Dickerson Run, Newell and Monessen yards. Last week the road served notice on its men that if they did not return to work by Friday noon, they would lose their seniority rights. The response to this notice was disappointing to the railroad officials, as only a few of the older men returned to their jobs. There is no road movement on the Pittsburgh & Lake Erie as yet, but the road is hauling solid trainloads from the Jones & Laughlin Steel Co.'s works at Woodlawn, Pa., also from other plants along the road. The Pennsylvania is doing a little better than last week. On Monday, May 10, this road moved 43,000 cars of freight from what is known as the Central Region, which runs from Altoona East to Crestline West, the normal average daily movement in this region being about 62,000 cars. The chief trouble the Pennsylvania is having is to man its Conway yards. In these yards, trains are made up for all points west, and the yards have been badly crippled ever since the strike started. On the Erie & Ashtabula and the Cleveland & Pittsburgh branches of the Pennsylvania, freight is being moved, but the men refuse to handle trains that have to be run through the Conway yards. The practice has been adopted by the railroads here of spotting cars just outside of the yards, hauling freight to these cars in trucks, so that they do not have to be handled through any railroad yards.

The Baltimore & Ohio is doing better than any of the local roads. It is accepting freight of all kinds in carload and less, for all points East and West, except where embargoes are on to points on connecting lines. This would apply to Cleveland, Lorain,

Newcastle, Akron and Youngstown. The officials of the Baltimore & Ohio say in another week they will be running normal, and without any trouble. On Monday, the men employed as switchmen and also some shop employees of the Bessemer & Lake Erie Railroad, owned and operated by the Carnegie Steel Co., went out on a sympathy strike. This road is primarily an ore road, and if the trouble should last very long it will affect the operations of blast furnaces, and in turn of steel works and finishing mills of the Carnegie company. This company on Tuesday had 17 furnaces banked on account of the railroad strike, but its finishing mills are operating on an average of 65 to 70 per cent.

On the Erie Railroad, which serves the Youngstown, Ohio, and other large manufacturing districts, new crews were put at work at Youngstown on Tuesday, and the Erie hopes in a few days to again serve the Farrell, Newcastle and Youngstown districts, where many important steel plants and finishing mills are located. Reports were current that the Brotherhood of Trainmen were back of the strike, but this has been investigated and found to be incorrect. An unofficial estimate has been made of the amount of finished steel products loaded on cars that are not being moved, but stored in works and mill yards, and the amount is put at fully 1,000,000 tons. It is said that subsidiaries of the Steel Corporation have at least 500,000 tons of finished steel products either loaded on cars or piled in mill yards awaiting empties for shipment. A leading independent steel company had on Monday 108,000 tons of finished steel products stored. Another had about 70,000 tons, and there is practically not a concern in the Pittsburgh or nearby districts that has not a large amount of steel awaiting empty cars. The Pennsylvania has notified its

employees by registered letters that unless they return to work by Wednesday noon, May 12, they will lose their seniority rights, and officials of the road claim they already have advices that a large part of the men will go back to work.

The fact that the Government has guaranteed to the railroads earnings at 6 per cent for six months, from March 1, makes the position of the railroads stronger, and there seems to be no doubt that they are going to fight out this strike to the end. The use of trucks for delivering steel from the mills to nearby customers is increasing daily. The Jones & Laughlin Steel Co. is hauling hundreds of kegs of nails and wire, also pipe, from Woodlawn to Pittsburgh, every day, the rate for trucking being 35c. per 100 lb. Some concerns are trucking their finished products as far as 300 or 400 miles, many truck loads of products for automobiles having gone to Detroit. No effort is being made to do new business, as steel mills do not want to take on more obligations until the railroad situation has cleared up.

Pig Iron.—Due to the railroad strike, practically nothing is being done in the local pig iron market. Some few sales of small lots of iron for spot delivery are being made, but in most cases furnaces will not guarantee shipment. A local interest is in the market for 1000 tons of standard Bessemer over the next three months, but has not closed. Small lots of No. 2 foundry iron have sold at \$45 at Valley furnace. It is estimated that between 25 and 30 blast furnaces in the Pittsburgh and Valley districts are closed on account of the railroad strike. The Shenango Furnace Co. is operating only one stack at Sharpsville, the molten Bessemer iron going to the Valley Mold & Iron Corporation to be used in making ingot molds, which are then shipped in solid trains.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh districts being \$1.40 per gross ton:

Basic	\$43.00
Bessemer	42.50
Gray forge	42.00
No. 2 foundry	44.00
No. 3 foundry	43.50
Malleable	44.00

Billets and Sheet Bars.—The supply of billets and sheet bars, in spite of the railroad strike, seems to be loosening up a little, but at the same time it is true that a number of sheet and tin mills are down because they cannot get shipments of bars from their regular sources of supply. The concerns in the Youngstown district that make sheet bars are practically down, and the Carnegie Steel Co. is operating its various steel mills to probably about 70 per cent of capacity, but is unable to make shipments to a number of important consuming centers, on account of the strike.

We now quote 4 x 4-in. soft Bessemer and open-hearth billets at \$38 to \$60; 2 x 2-in. billets, \$42; Bessemer sheet bars, \$42 to \$70; open-hearth sheet bars, \$42 to \$80, and forging billets, ordinary carbons, \$80 to \$85 base, all f.o.b. Youngstown or Pittsburgh mill.

Structural Material.—Local shops say they are not bidding actively on new work on account of the strike, and not much new work is being placed. The McClintic-Marshall Co. has taken 200 tons for a new shop for the Cambria Steel Co., Johnstown, Pa., and 350 tons for a sheet mill building for the Whitaker-Glessner Co. at Beach Bottom, W. Va. The Carnegie Steel Co. is still quoting plain material up to 15 in. at 2.45c., another local interest is quoting 2.90c. to 3.25c., depending on the tonnage and whether the buyers are regular customers. A mill outside the Pittsburgh district is holding plain material firm at 4c. Pittsburgh.

Ferrolloys.—Not much is being done on account of the railroad strike. A good many steel mills are down or operating to only part capacity, and consumption of ferrolloys is less than for a long time. Prices on domestic ferromanganese are very firm, at \$200 for 80 per cent for last half delivery, and \$250, or higher, for prompt shipment. Two leading makers of spiegeleisen are now quoting \$70 to \$75 at furnaces.

We quote 76 to 80 per cent domestic ferromanganese \$200 for last half delivery and \$250 for prompt delivery, with a reduction of \$1.50 to \$1.75 per unit for lower percentages. We quote 50 per cent ferrosilicon at \$80 to \$85 and 18 to 22 per cent spiegeleisen at \$70 to \$75, delivered. Prices on Bessemer ferrosilicon are: 9 per cent, \$56.50; 10 per

cent, \$59.50; 11 per cent, \$62.50; 12 per cent, \$66.10. We quote 6 per cent silvery iron, \$45.75 to \$46.25; 7 per cent, \$50 to \$50.50; 8 per cent, \$52 to \$52.50; 9 per cent, \$54 to \$54.50, and 10 per cent, \$56.50 to \$57. An advance of \$4.33 per gross ton is charged for each 1 per cent silicon for 11 per cent and over on Bessemer ferrosilicon, and an advance of \$2.50 per gross ton is charged for each 1 per cent silicon for 11 per cent and over on silvery iron. All the above prices are f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, which has a uniform freight rate of \$2.90 per gross ton for delivery in the Pittsburgh district.

Plates.—Nothing is being done by the railroads in the way of placing orders for steel cars, and likely there will not be any large orders placed until the strike is ended. Output of plates is down to about 60 per cent of normal, but prices are easing. The Carnegie Steel Co. is still quoting sheared plates of tank quality, $\frac{1}{4}$ in. and heavier, at 2.65c., and another mill is quoting 2.90c. to 3c. to regular customers, while outside mills quote from 3c. to 3.50c., Pittsburgh. The premium price of 4c. on plates, named for some time by outside mills, has pretty well disappeared, and they are now quoting at 3.50c. or under.

We quote sheared plates of tank quality, $\frac{1}{4}$ in. and heavier, at 2.65c. to 3c. for very indefinite delivery, while prices on $\frac{1}{4}$ -in. and heavier plates, named by mills that will agree to ship out in three to four months, is 3.50c.

Sheets.—Operating conditions of the American Sheet & Tin Plate Co. have improved very much, and in the past week it has started its Wellsville, New Philadelphia and Aetna Standard works, all of which had been closed on account of the railroad strike. This company is now operating nearly full all of its sheet mills excepting two, and is running at about 80 per cent of its hot sheet mill capacity. The gap between the prices on sheets of the leading interest and the independent mills is being steadily narrowed, but as yet the average prices of the independent mills are probably close to \$20 per ton higher than those of the leading interest. Many plants are running short on account of non-delivery of sheet bars.

We quote No. 28 gage box annealed one-pass black sheets at 4.35c. to 6.50c.; No. 28 galvanized, 5.70c. to 8.50c., and Nos. 9 and 10 blue annealed at 3.55c. to 6c., the lower prices named being the March 21 schedules, which are still named by the leading interest, while the higher prices represent a fair range of quotations by the independent mills.

Tin Plate.—The American Sheet & Tin Plate Co. is also doing better in operating all its tin plate mills, last week having started its Saberton and Crescent works and is now operating to about 40 per cent of hot tin plate capacity, as against 15 per cent two weeks ago when the railroad strike started. However, three or four independent tin plate mills are practically down for lack of steel and may remain closed for some time. One large plant that had sheet bars delivered only 200 feet from the mill had to close down as the men refused absolutely to switch the cars into the mill yards. A leading tin mill in this district closed on Tuesday, having been notified by its Youngstown source of supply of steel that no more could be shipped until the strike was ended. Prices on tin plate quoted by the independent mills range from \$7 to \$8.50 per base box. More of the can companies that compete with the American and Continental have been able to contract at \$7 per base box, but other customers, such as makers of tin and other goods, who use tin plate for other purposes than food containers have paid \$7.50 up to \$8 for base boxes. One leading interest reports it has lost close to 1,000,000 boxes of production in tin plate, owing to the strike.

We now quote tin plate to domestic consumers for remainder of the year delivery at \$7 to \$8 base box, stock items \$8.50 to \$9, and for export \$11 to \$12 per base box, all f.o.b. Pittsburgh.

Steel Rails.—The Carnegie Steel Co. reports it is filled up on both standard and light sections over this year. This company is still quoting the March 21, last year, prices, which are 2.45c. for 25-lb. to 45-lb. sections, 2.49½c. for 16-lb. and 20-lb. sections, 2.54c. for 12-lb. and 14-lb. sections, and 2.58½c. for 8-lb. and 10-lb. sections. The company quotes on standard sections, 50-lb. and heavier, \$45 for Bessemer and \$47 for open-hearth stock. A leading mill outside the Pittsburgh district has advanced its prices on light rails \$5 per ton, and is now quoting 25-lb. to 45-lb. sections at 3.75c.; 16-lb. and 20-lb. sections, 4.75c., and 12-lb. and 14-lb. sections,

9.50c. at mill, 12-lb. sections being the lightest the company rolls.

Wire Rods.—A local mill reports it has over 11,000 tons of rods in stock which it cannot ship on account of the railroad strike. The demand is active, but none of the local mills is making any shipments. We quote soft Bessemer and open-hearth rods at \$70 to \$75, screw stock rods, \$80 to \$85, and high carbon rods, \$85 to \$100 at mill, prices depending on the carbon content.

Wire Products.—Local mills are not selling, as they cannot make shipments, and in addition have all the business on their books they care to have until the railroad strike is ended. The American Steel & Wire Co. is still quoting \$3.25 base on wire nails and \$3 base on plain wire. Independent mills are quoting \$4 base on wire nails, extras as per the recent card; cement-coated nails, \$3.60, extras as per the old card, and plain wire, \$3.50, extras as per the old card, and plain wire, \$3.50, extras as per the new card. Prices on wire products are given in detail on page 1407.

We quote wire nails at \$3.25 base, this being the price of the American Steel & Wire Co., and \$4 base on the new card recently issued by four or five of the independent mills. We quote bright basic wire at \$3, this being the price of the American Steel & Wire Co., and \$3.50, this being the price of most of the independent mills.

Iron and Steel Bars.—Some consumers report less trouble in placing orders for iron and steel bars for delivery in three to four months, in spite of the fact that the railroad strike has cut down production very materially. One mill reports a sale of 600 tons of reinforcing steel bars rolled from billets at 4c. at mill.

We quote steel bars rolled from billets at 2.35c., this being the price of the Carnegie Steel Co. for very indefinite delivery, likely not before first quarter of next year. Other mills rolling steel bars from billets quote from 3c. to 4c. at mill, prices depending entirely on the buyer and the delivery wanted. The demand for concrete reinforcing steel bars is fairly active, and we quote these, when rolled from billets, at 4c. to 4.25c., and from old steel rails at about 3.50c. at mill. We quote common iron bars at 4.25c. to 4.50c. and refined iron bars at 4.50c. to 5c. in carloads, f.o.b. mill, Pittsburgh.

Cold-Rolled Steel Bars.—Some shipments are going to Detroit and Toledo by truck, to automobile builders, but shipments by freight are cut off on account of the strike, and stocks piled in warehouses and loaded on cars are heavy. We quote cold-rolled steel bars at \$4.10 to \$4.25 per 100 lb. to regular customers, f.o.b. at mill. Premium prices are disappearing to some extent, but still range from 5c. to 7c. at mill.

Hot-Rolled Strip Steel.—It is estimated that the automobile trade takes about 60 per cent of the total output of hot and cold-rolled strips. Local makers say they are still able to get shipments through to Toledo and Detroit by freight, but cannot ship anything East. The minimum price of two leading makers on hot-rolled strips is 5½c. per lb., at mill, to regular customers only, and these two makers state they have not made any sales above or below that price. Premium prices range from 7c. to 9c. per lb. at mill.

Cold-Rolled Strip Steel.—The minimum price of two local makers is 8½c. per lb. at mill. Premium prices range up to 10c. or higher. Shipments are still going through by freight to Detroit and Toledo.

Spikes.—Only small lots are being placed for shipment at convenience of the mill. No large contracts have been placed here for some time.

We quote standard spikes, ½ to 9/16 in. and larger, \$1 base per 100 lb. in carload lots of 200 kegs of 200 lb. each, and small spikes, ¾ in. and 7/16 in., \$4.50; 5/16 in., \$5; boat and barge spikes, \$4.25 f.o.b. Pittsburgh. Tie plates, \$3 to \$4 per 100 lb.

Boiler Tubes.—Mills making locomotive and boiler tubes and also seamless tubes, in this district are still operating, but are piling a good part of their product. Discounts on iron and steel tubes are given on page 1407.

Iron and Steel Pipe.—There is not the hysterical demand for pipe and oil well tubular goods at present that has been a feature of the market for so long. All the mills are filled up for months, and are not actively

seeking new business, which could readily be booked, if the mills would care to quote. Discounts on iron and steel pipe are given on page 1407.

Coke.—The railroad strike has made a big hole in production of coke, the output of the two Connellsville regions last week having been 176,775 net tons, a slight increase over the previous week. Switchmen and shop men employed by the Monongahela Railroad, this being a coal and coke line operated jointly by the Pennsylvania and Pittsburgh and Lake Erie Railroads, have gone on a sympathy strike, and this will cripple shipments of both coal and coke. Standard furnace coke for prompt delivery brings \$11 to \$12 and standard 72-hr. foundry \$12 to \$13, in net tons at oven.

Old Material.—The railroad strike has tied up the scrap business and very little material is moving to consumers' mills, embargoes being on at nearly all important consuming points. Several sales of selected heavy steel melting scrap were made in the past week for delivery to the Youngstown and Newcastle districts at about \$25 delivered. Prices are only fairly strong, but with the railroad strike settled, dealers look for an upward movement in values.

We quote for delivery to consumers' mills in the Pittsburgh and other districts that take Pittsburgh freight rates, as follows:

Heavy melting steel, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	\$25.00 to \$25.50
No. 1 cast for steel plants	34.00 to 35.00
Re-rolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Franklin, Pa., and Pittsburgh	32.00 to 33.00
Compressed steel	22.00 to 22.50
Bundled, sheet sides and ends, f.o.b. consumers' mills, Pittsburgh dist.	16.00 to 16.50
Bundled sheet stamping	15.00 to 15.50
No. 1 busheling	17.50 to 18.00
Railroad grate bars	26.00 to 26.50
Low phos. melting stock (bloom and billet ends, heavy plates) ½ in. and heavier	30.00 to 30.50
Railroad malleable	30.00 to 30.50
Iron car axles	37.00 to 38.00
Locomotive axles, steel	34.00 to 35.00
Steel car axles	31.00 to 32.00
Cast iron wheels	40.00 to 41.00
Rolled steel wheels	29.00 to 30.00
Machine-shop turnings	15.50 to 16.00
Sheet bar crop ends (at origin)	28.00 to 28.50
Heavy steel axle turnings	20.00 to 21.00
Heavy breakable cast	32.00 to 32.50
Cast iron borings	17.50 to 18.00
No. 1 railroad wrought	31.00 to 32.00

Belgium Waiting on Germany and Lorraine

BRUSSELS, BELGIUM, April 25.—It is reported here that English automobile builders have given orders for small steel castings to works in Holland. One must remember that it is not far by canal from Holland to the German frontier, and certain Dutch commission houses are in reality nothing more than exporters for concerns in Westphalia. There are several small foundries in the region of Zutphen, which could perhaps undertake this kind of work, but prices quoted in Dutch florins exceed by 30 per cent the prices which the Belgian foundries would name in francs in Belgium if they had the coke, and if the receipts of all materials were less irregular than they are to-day.

Semi-finished material is very scarce, and one squints a little toward the United States on hearing that some Pittsburgh mills have blooms and billets for August and September delivery. No such material is to be obtained in Belgium. The rolling mills of Belgium would be in a very easy situation if billets ordered in Lorraine were being delivered.

We have more than 40 blast furnaces out of blast, and every effort is being made to add to the number in operation. There is every evidence that we could increase the volume of our orders and take care again of our export trade which has inundated us, especially for iron to meet a precise specification. To-day in our iron products scrap enters so largely that in the long run there is some risk in guaranteeing quality. It is time that more iron were available for the rolling mills. The coke appears to be less variable in quality, and a first train from Germany is announced!

Chicago

CHICAGO, May 11.

The continued severity of the railroad strike constitutes a decided limitation on market activity. While reports from some sources are encouraging, these are balanced by others to the effect that the situation is worse. On the whole, iron and steel production has shown some improvement. The leading interest has refired two additional blast furnaces, one at Gary and one at South Chicago, making a total of 21 active stacks out of 29. Its operations are now at the rate of a little better than 80 per cent of ingot capacity. The Inland Steel Co. continues to operate on a 70 per cent basis and the situation with the other mills is about the same as a week ago. The foremost merchant iron producer is obtaining more satisfactory production than last week, and is shipping more freely. The local by-products coke plant has been able to raise its output to about 80 per cent of normal, but the other merchant coke plants at Joliet and Milwaukee are still on 20 and 40 per cent basis respectively.

The attention of consumers is now focused almost entirely on securing delivery on previous commitments and, failing in that, on obtaining spot material to tide them over the period. For the time being buying for future needs has been forced into the background. Perhaps the most serious difficulty confronting consumers is the fuel problem. Although melters are gradually getting larger allotments from the local by-products coke producer as the result of improved operations, it is now exceedingly difficult to get any shipments through from the eastern beehive ovens. Locally the labor situation also is seriously affecting foundries.

On Sunday, at a meeting of molders employed in shops belonging to the Chicago Foundrymen's Association, it was decided by a vote of 1000 to 200 to reject the offer of the employers and to press the original demands of the union. As a result, the 32 jobbing foundries constituting the association are now closed by a strike.

Ferroalloys.—A carload of spot ferromanganese recently brought \$240, delivered. Otherwise the market in the ferroalloys has been quiet.

We quote 75 to 80 per cent ferromanganese, last half, delivered, \$200; spot, delivered, \$225; 50 per cent ferrosilicon at \$85 delivered; spiegelisen, 18 to 22 per cent, \$75 furnace.

Pig Iron.—Owing to the transportation situation, the market is still quiet. The interest of melters is concentrated on preventing a shutdown and consequently the demand is confined to spot iron and coke. The local merchant furnaces are operating more satisfactorily and are shipping more freely than a week ago. The local source of by-products foundry coke has increased its output to 80 per cent of normal, but the Joliet and Milwaukee plants have shown little improvement. It is exceedingly difficult to get shipments through from the Connellsville region, but one recent sale of spot material brought \$14, ovens, and as high as \$15.50 has been offered by melters. In pig iron purchases of prompt material in carloads is the rule, but within the past week a 1000-ton lot of southern foundry for early delivery brought \$42 and \$43, base, Birmingham, and several 500-ton lots of prompt malleable were bought at \$46.25, Ohio furnace. The only important sale for last half shipment involved 1000 tons of malleable and 500 tons of silvery, the latter bringing the new Jackson County price of \$57.50, furnace, for 8 per cent material. Among inquiries for second half shipment we note one from a Wisconsin melter for 1000 tons of foundry. Quotations on southern foundry range from \$42, base, Birmingham, to \$45, with the lower figure the ruling price. A sale of 150 tons of copper free low phosphorus was recently closed at \$54, Ohio furnace. Copper bearing iron, on the other hand, is commanding from \$47 to \$50, eastern furnace. Foundry operation in this city has been crippled by a molders' strike, which has closed 32 member plants of the Chicago Foundrymen's Association.

The following quotations are for iron delivered at consumers' yards except those for Northern foundry, malleable

and steel-making irons, including low phosphorus, which are f.o.b. furnace and do not include a switching charge averaging 50c. per ton.

Lake Superior charcoal, average sil.	
1.50 (other grades subject to usual differentials), deliv. at Chicago...	\$57.50
Northern coke, No. 1 sil. 2.25 to 2.75...	49.25
Northern coke foundry, No. 2, sil.	
1.75 to 2.25.....	43.00
Northern high phos. foundry.....	43.00
Southern coke, No. 1 foundry and No. 1 soft, sil. 2.75 to 3.25.....	50.20
Southern coke, No. 2 foundry, sil.	
2.25 to 2.75.....	48.70
Southern foundry, sil. 1.75 to 2.25...	47.00
Malleable, not over 2.25 sil.....	43.50
Basic.....	42.00
Low phos. (copper free).....	54.00
Silvery, 7 per cent.....	\$56.40 to 59.30

Railroad Rolling Stock.—The Illinois Central has issued an inquiry for 1000 refrigerator cars, 200 flat cars and 45 passenger service cars. The Baltimore & Ohio has awarded a contract for the repair of 1200 hopper car bodies to the Pressed Steel Car Co. Of its repair inquiry issued several weeks ago, 500 refrigerator car bodies and 600 flat car bodies remain unlet. In addition to these, it will contract for the repair of 2000 box cars, 1000 composite gondola cars and 300 to 500 refrigerator cars. The Wabash has awarded repairs on 500 freight cars to the Keith Railway Equipment Co. The International Harvester Co. has ordered 500 steel gondolas from the Standard Steel Car Co. The Southern Pacific has ordered 250 general service cars from the Mt. Vernon Car Mfg. Co. The Union Gas & Electric Co., Cincinnati, has bought 100 hopper cars from the Pressed Steel Car Co.

Plates.—The failure of the transportation situation to show any appreciable improvement during the past week has discouraged the placing of new business and has focused the attention of consumers almost exclusively on the problem of securing delivery on old commitments. Inquiries for cars continue to develop in a limited way and a small number each week mature into orders. On the whole, however, the market is quiet. The leading local independent, which has had little tonnage in plates to offer for several months, is now booking third quarter orders at from 3.77c. to 4.02c., f.o.b. mill, depending on the nature of the business.

The mill quotation is 2.65c. to 4c., Pittsburgh, the freight to Chicago being 27c. per 100 lb. Jobbers quote 4.17c. for plates out of stock.

Structural Material.—Difficulties in financing higher labor and material costs and the unsatisfactory transportation situation have combined to curtail construction work. There is a dearth of new fabricating inquiries, and one hears less of efforts by Eastern mills to secure tonnages in shapes in this district, a development which is accounted for, no doubt, by reduced operations and uncertainty as to shipments. Nevertheless, on an attractive inquiry for 1000 tons of structural shapes an Eastern independent offered a price of 2.75c., Pittsburgh, and delivery within 60 days. The leading local independent which has been out of the market for several months, is now taking third quarter business at 3.52c. to 3.77c., mill, for plain material. Notwithstanding the decline in fabricating inquiries, two good sized projects have just been closed. For a smelter to be built by the United Verde Copper Co., Jerome Junction, Ariz., the Kansas City Structural Steel Co. will supply 4200 tons. The Christopher & Simpson Iron Works will fabricate 2460 tons for the Masonic Temple, Topeka, Kan. Some fabricators are now well booked with work. One Milwaukee company will be out of the market until Oct. 1, and another steel erector in the same city is filled up for three months. Additional awards included:

Mesabi Iron Co., magnetic ore concentrating plant, Bab-bitt, Minn., 800 tons, to Minneapolis Steel & Machinery Co.
First National Bank Building, Santa Ana, Cal., 500 tons, to Baker Iron Works.
Steel Sales Corporation, warehouse, Chicago, 278 tons, to Toledo Bridge & Crane Co.
Oshkosh Motor Truck Co., plant, Oshkosh, Wis., 210 tons, to Vulcan Mfg. Co.
Marion Machine, Foundry & Supply Co., trusses, columns and braces, Marion, Ind., 207 tons, to unnamed independent.
United States Glue Co., pure food plant, Carrollville, Milwaukee County, Wis., 1000 tons of reinforcing bars, to P. J. Kalman Co.

The only new inquiry to be noted is 250 tons for a new plant at Milwaukee for the Evinrude Motor Co.

The mill quotation is 2.45c. to 4c., Pittsburgh, which takes a freight rate of 27c. per 100 lb. for Chicago delivery. Jobbers quote 3.97c. for materials out of warehouse.

Bars.—With both the leading interest and the foremost independent out of the market and Eastern mills severely crippled by the railroad strike, business in mild steel bars has been largely shut off. The market in bar iron and rail carbon steel bars is also restricted, as the Chicago district mills, on account of heavy bookings, are taking additional orders from their regular customers only. Their commitments in the smaller sizes are particularly heavy, and, as has been previously mentioned, one bar iron mill is asking a quarter of a cent extra to discourage the placing of further business of this character. On heavier bars it continues to quote 3.75c., mill, which is the price named on all sizes by other makers.

Mill prices are: Mild steel bars, 2.35c. to 4c., Pittsburgh, taking a freight of 27c. per 100 lb.; common bar iron, 3.75c., Chicago; rail carbon, 3.75c., mill.

Jobbers quote 3.87c. for steel bars out of warehouse. The warehouse quotation on cold rolled steel bars is 5.80c. for rounds and 6.30c. for flats and squares, an extra of 15c. per 100 lb. applying to orders exceeding 1000 lb. and under 2000 lb. and an extra of 35c. for orders up to 1000 lb.

Sheets.—The leading independent, which has concluded allocating its third quarter output among its customers, found that it was able to take care of only 50 per cent of their needs. An Eastern mill is offering June delivery on a limited tonnage of blue annealed in the heavier gages at 6.50c., Pittsburgh.

Mill quotations are 4.35c. to 6.50c. for No. 28 black; 3.55c. to 6c. for No. 10 blue annealed, and 5.75c. to 8.50c. for No. 28 galvanized, these all being Pittsburgh prices, subject to a freight of 27c. per 100 lb. to Chicago. The lowest prices are those of March 21.

Jobbers quote, Chicago delivery out of stock, No. 10 blue annealed, 7.02c.; No. 28 black, 8c.; No. 28 galvanized, 9.50c.

Wire Products.—As the transportation situation has improved little, if at all, the problem of moving shipments still holds the center of the stage. Jobbers, however, seem less disposed to pay premium prices and this, it is said, is accounted for by the fact that retailers have larger stocks than was generally supposed. For mill prices see finished iron and steel, f.o.b. Pittsburgh, page 1407.

Rails and Track Supplies.—Unless output exceeds expectations, the leading interest's rail commitments will be carried over into the first quarter of next year. Despite the fact that several good sized inquiries have been received of late, as noted in this column, no new orders have been accepted. In light rails the market is active and orders are being received from both domestic and foreign sources, the coal mines being the principal buyers in this country. There is a surprising volume of business in track fastenings. Although deliveries range from three to five months, practically every inquiry received results in an order. Although much of the buying is in small lots to complement previous purchases, some round lots are being placed, among them a recent order for 9000 kegs of spikes.

Standard Bessemer rails, \$45 to \$55; open hearth rails, \$47 to \$57. Light rails, 2.45c. to 3.50c. f.o.b. makers' mills. Standard railroad spikes, 3.55c. to 4c. Pittsburgh. Track bolts with square nuts, 4.90c. to 5c., Pittsburgh. Steel tie plates and steel angle bars, 2.75c., Pittsburgh and Chicago; tie plates, iron, 3.75c. f.o.b. makers' mills.

Cast Iron Pipe.—The market is exceedingly dull, the only new inquiry to be noted being 50 tons to be let by Carroll, Neb., on May 12.

We quote per net ton f.o.b. Chicago, ex-war tax, as follows: Water pipe, 4-in., \$79.80; 6-in. and above, \$76.80; class A and gas pipe, \$2 extra.

Bolts and Nuts.—The situation is decidedly discouraging for both manufacturers and consumers. The former have been forced to curtail operation in some cases to the extent of 50 per cent because of the non-delivery of raw material and the latter are experiencing difficulty in securing even those shipments which are en route. The bolt and nut plants which have been unable to keep up with the demand ever since the steel strike have now been set back much further in their efforts to supply the needs of the country. For mill

prices, see finished iron and steel, f.o.b. Pittsburgh, page 1407.

Jobbers quote structural rivets, 5.37c.; boiler rivets, 5.47c.; machine bolts up to $\frac{3}{4}$ x 4 in., 30 per cent off; larger sizes 20 off; carriage bolts up to $\frac{3}{4}$ x 6 in., 20 off; larger sizes, 15 off; hot pressed nuts, square tapped and hexagon tapped, 50c. off; coach or lag screws, gimlet points, square heads, 40 per cent off. Quantity extras are unchanged.

Old Material.—Because of the continued transportation difficulties, the market is practically at a standstill. Borings and turnings are weak, melting steel is soft, rolling mill grades are inactive, while foundry grades are holding their own. Inquiries for several thousand tons of cast scrap have been received of late, but as prompt delivery was desired in all cases, sellers were unable to meet the demand. In the absence of trading, the prices quoted below are largely nominal. The railroad lists of the week include 5000 tons offered by the Great Northern, 3000 by the Illinois Central, 1000 tons each by the Wabash and the St. Paul, and smaller tonnages offered by the Pere Marquette, the Chicago & Eastern Illinois, the Soo Line, the Chicago Great Western and the Michigan Central.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Iron rails	\$33.00 to \$34.00
Relaying rails	45.00 to 55.00
Car wheels	37.00 to 38.00
Steel rails, re-rolling	31.50 to 32.00
Steel rails, less than 3 ft.	28.50 to 29.00
Heavy melting steel	23.00 to 23.50
Frogs, switches and guards, cut apart	23.00 to 23.50
Shoveling steel	22.50 to 23.00
Low phos. heavy melting steel	28.00 to 28.50
Drop forge flashings	18.50 to 19.50

Per Net Ton	
Iron angles and splice bars	\$30.50 to \$31.50
Steel angle bars	23.50 to 24.00
Iron arch bars and transoms	31.50 to 32.50
Iron car axles	39.00 to 40.00
Steel car axles	32.50 to 33.50
No. 1 busheling	20.00 to 21.00
No. 2 busheling	14.50 to 15.00
Cut forge	24.00 to 24.50
Pipes and flues	16.50 to 17.00
No. 1 railroad wrought	26.50 to 27.00
No. 2 railroad wrought	24.00 to 24.50
Steel knuckles and couplers	23.00 to 23.50
Coil springs	25.00 to 25.50
No. 1 cast	37.50 to 38.00
Boiler punchings	24.00 to 24.50
Locomotive tires, smooth	23.00 to 23.50
Machine shop turnings	11.00 to 11.50
Cast borings	13.00 to 13.50
Stove plate	30.00 to 30.50
Grate bars	29.50 to 30.00
Brake shoes	25.50 to 26.00
Railroad malleable	26.50 to 27.00
Agricultural malleable	26.50 to 27.00
Country mixed	17.50 to 18.50

The Hyman-Michaels Co., dealer in salvaged material and scrap iron and steel, Chicago, has established permanent New York headquarters at 906 to 907 Park Row Building, 15 Park Row, in charge of Joseph Hyman, president.

Buffalo

BUFFALO, May 10.

Pig Iron.—Furnaces were occupied during the past week with maintaining operation. Though the second yardmen's strike found the iron interests better prepared, and though the roads seem to be combatting the second strike more successfully, furnaces have obtained only a minimum of relief over and above what they would obtain were the roads forced into the situation illustrated in the first strike. Just now it would appear that furnaces will not have to shut down or bank as was the case during the first strike, but this is contingent upon the railroads being able to operate better than they are doing. As improvement is gradual but steady, it is fair to assume that the furnaces will weather the disturbance without having to do more than pursue a cautious policy. Iron is being piled to await normal conditions, for cars are extremely scarce.

The last strike has served to practically retire from the market a furnace interest that had been doing more or less selling since late last fall. This interest announces positively that it will have to strain every effort to get out the iron it has already contracted for on schedule time. This furnace has not shipped a ton of iron during the past week. Another furnace which

is located in a better position, and close to lines of the New York Central and Erie which are beginning to operate fairly well, announces it made shipments Thursday, Friday and Saturday. This interest has sold between 6000 and 7000 tons of iron, all foundry, for delivery over the last half. Included in this lot was 400 tons of No. 1 iron which sold for \$48, 5200 tons of No. 2X, 2.25 to 2.75 silicon, selling for \$46.25, and a lot of No. 2 plain, 1.75 to 2.25 silicon, selling for \$45. Another interest booked about 1000 tons of foundry iron of all grades at the usual base price of \$45. The other two furnaces did no selling. Inquiry is fair, and some producers say there are indications that many foundries have not covered in full. While some have no doubt bought sparingly, others have bought more than their needs. One inquiry during the week was an export query for 1000 tons of basic. It was not taken in this market. An eastern interest which sought 2000 tons here declined to purchase at \$45, though it is possible a lower price would have been agreed to, had it been known by the furnace interest that most of the iron desired was of a silicon content lower than \$1.75.

We quote f.o.b. Buffalo:

No. 1 foundry, 2.75 to 3.25 sil.....	\$48.00
No. 2 X foundry, 2.25 to 2.75 sil.....	46.25
No. 2 plain, 1.75 to 2.25 sil.....	45.00
Basic	\$44.00 to 45.00
Malleable	46.25
Lake Superior charcoal.....	58.00 to 60.00

Finished Iron and Steel.—Sold-up or practically sold-up conditions and lack of cars due to the yardmen's strike, were the contributing factors in making for a slack market during the past week. Though inquiry has been checked by the strike, it still maintains a healthy tone with producers unable to supply the demand. Bar inquiry has been good though there has been a lighter demand for structurals and plates. Reinforcing bar demand is steady for small tonnages, but no great volume of business is being taken. Difficulties in the delivery of intermediate bars, not only because of the strike, but on account of heavy business at the mills, is partially responsible for this condition. There are many inquiries made which are evidently feelers and with little actual business resulting. One mill reports that it is experiencing some success in getting out its material by the trainload, sending it direct to main lines without switching cars individually.

Jobbers quote the following prices for this territory: Steel bars, 4.61c.; iron bars, 5.26c.; structurals, 4.46c.; plates, 4.66c.; No. 10 blue annealed sheets, 6.51c.; No. 28 black sheets, 8.25c.; No. 28 galvanized sheets, 9.50c.; bands, 5.81c.; hoops, 6.06c.; cold rolled steel, 6.00c.

Old Material.—The market maintains the stagnant condition of the past month. Dealers are unable to get anything in or out, and in the absence of specific guarantees on the shipment of scrap to consumers, are unable to make sales. Most sales here are done on the 30-day delivery proviso and with the upheaval of transportation due to the second unauthorized switchmen's strike, there is no way of guaranteeing delivery. Cars are few and far between, and though the railroads seem to be doing a little better each day, there is little incentive to trading. Some plants in the district are beginning to feel the pinch of lack of supplies, and there is an urgent inquiry from some quarters for heavy melting steel, turnings and borings. With the loss of production on account of the lack of fuel, etc., a corresponding decrease is shown in the output of scrap. Dealers are convinced that there will be an exceptionally strong market when the railroads remove embargoes and are able to guarantee delivery of shipments.

We quote dealers' asking prices, per gross ton f.o.b. Buffalo, as follows:

Heavy melting steel, regular grades.....	\$25.00 to \$26.00
Low phos., 0.04 and under.....	32.00 to 33.00
No. 1 railroad wrought.....	31.00 to 32.00
No. 1 machinery cast.....	38.00 to 39.00
Iron axes	40.00
Steel axes	41.00 to 42.00
Car wheels	37.00 to 38.00
Railroad malleable	31.00 to 32.00
Machine-shop turnings	16.50 to 17.00
Heavy axle turnings	20.00 to 21.00
Clean cast borings.....	17.00 to 18.00
Iron rail	30.00 to 31.00
Locomotive grate bars.....	24.00 to 25.00
Stove plate	32.00 to 33.00
Wrought pipe	21.00 to 22.00
No. 1 busheling	20.00 to 21.00
Bundled sheet stamping.....	17.00 to 18.00

Birmingham

BIRMINGHAM, ALA., May 11.

Pig Iron.—Larger foundry iron operators in the Birmingham district are making sales at \$42, base, through the last half and over a wide territory in large aggregate tonnage. As a rule, these interests, when they have spot iron available for regular customers, do not ask a higher price, but the smaller furnace interests charge anything from \$42 to \$44. One lot of 800 tons for June and July delivery, southern consumption, brought \$43. Lots of 1000 and 2000 tons, southern delivery, sold to pipe makers and others at \$42. This was last half delivery. The \$38 iron is on paper only with no indication of an early actual reappearance. There is greater probability of a \$45 base. Stocks on Alabama yards decreased by 55,000 tons in April. There remain only about 60,000 to 70,000 tons of the foundry and little else. One interest has no stocks and is shipping the day's make almost warm. Only one has much iron on hand and that is cared for by sales. Repetition of April's record will almost wipe out stocks. April production was 42,000 tons in excess of 1919, and that of May will show a still greater excess, because at this time last year stocks were going out, while effort now is to maximum output. Maximum capacity would be attained but for the shortage of coal. Operations at all steel works are around maximum. It has been estimated by experts that by July 1 the Alabama sanitary pipe melt, owing to the dozen new works, will have increased 100 per cent, making total capacity of around 25,000 tons per month. Other new foundries are also coming in, including the Unit Stove & Furnace Co., located here by the Orbon Stove Co., Belleville, Ill.

We quote per gross ton, f.o.b. Birmingham district furnaces, the Tennessee company excepted, as follows:

Foundry, sil. 1.75 to 2.25.....	\$42.00 to \$44.00
Basic	41.00 to 43.00
Charcoal	55.00

Cast Iron Pipe.—The United States Cast Iron Pipe & Foundry Co. is simultaneously moving an additional 3000 tons of pipe through Mobile and the Panama Canal to the Pacific Coast and 5000 tons through Jacksonville, Fla., to Tokio, Japan. It also recently shipped 500 tons of water pipe to Batavia, Java. Export shipments through southern ports from southern shops may suffer and the manufacture be diverted to northern shops close to tidewater in case the increase in the Birmingham export rail rate fixed for May 10 shall not be suspended. The increase is from \$1.90 to \$3.40.

Old Material.—The old material market remains listless as to heavy steel, but several grades of cast have risen in price and the movement is active. Wrought has moved much higher owing to demand from resuming plants.

We quote per gross ton, f.o.b. Birmingham district yards prices to consumers, as follows:

Steel rails	\$21.00 to \$22.00
No. 1 steel.....	19.00 to 20.00
Cast iron borings.....	14.00 to 15.00
Machine shop turnings.....	14.00 to 15.00
No. 1 cast.....	34.00 to 35.00
Car wheels	32.00 to 33.00
Tramcar wheels	31.00 to 32.00
Steel axles	29.00 to 30.00
No. 1 wrought.....	26.00 to 27.00

Trumbull-Cliffs Furnace Co. Will Build Large Stack

The Trumbull Steel Co., Warren, Ohio, and the Cleveland-Cliffs Iron Co., Cleveland, have arranged for the organization of a furnace company, to be known as the Trumbull-Cliffs Furnace Co., to construct a modern 600-ton blast furnace on property adjacent to the Trumbull Steel Co.'s plant at Warren. Freyn, Brassert & Co., Chicago, have been employed as consulting engineers in connection with erection of the plant. It is expected the entire product of the furnace will be used by the Trumbull Steel Co.'s open-hearth department. Ore for the stack will be supplied from the properties in which both companies are interested.

New York

NEW YORK, May 11.

Pig Iron.—The first sale of pig iron made for shipment to Germany since the beginning of the war, and perhaps for a much longer period, has been made, consisting of 1000 tons of foundry iron at full market price. Another sale of 1000 tons for export has been made and the ending of the strike of dock laborers at Rotterdam is making it possible to forward about 5000 tons which had been sold but could not be shipped to that port. Some other shipments are being made to foreign countries through southern ports, as the railroad situation in the South is much better than in the North. Locally the tie-up of railroad cars due to the switchmen's strike is as complete as at any time. A very small tonnage of pig iron is being forwarded to suburban points and brought into Jersey City trucks, but this is almost the only iron that is being received in Greater New York. Naturally under such conditions the market is dull in this city, and there is not much activity in New England, where the foundries are having all they can do to keep in operation on account of difficulty in obtaining coke and pig iron. One company which has been in the market, at first for from 8000 to 10,000 tons, and later for 4000 tons, has finally placed an order for about 3300 tons. There is a fair demand for prompt iron. The usual quotation on No. 2X Virginia iron is now \$45 furnace, although one company is still reported to be in the market at \$43.25. Reports indicate that there is more southern iron obtainable than had been estimated recently.

We quote for delivery in New York as follows:

East. Pa., No. 1 fdy., sil.	2.75 to 3.25	\$50.05 to \$51.05
East. Pa., No. 2 X fdy., sil.	2.25 to 2.75	49.05 to 50.05
East. Pa., No. 2 fdy., sil.	1.75 to 2.25	47.80 to 48.80
Buffalo, sil.	1.75 to 2.25	47.90 to 48.90
No. 2 X Virginia, sil.	2.25 to 2.75	48.65 to 49.60

Ferroalloys.—It is stated that in some quarters deliveries of domestic ferromanganese, as well as some British, on contract are falling behind and that as a consequence consumers are seeking to cover their requirements in other directions. Otherwise the market is unchanged and very strong at \$225 and \$250 for delivery before July 1, and \$200, delivered, for the American alloy for the last half with a limited amount of British alloy available at \$195, seaboard, for shipment from August on. Business is confined to small lots for any position. It is interesting to note from British trade papers that the situation there is such that steel makers are using calcium silicide as a substitute for ferromanganese as well as various alloys generally known as silico-manganese, for which from £55 to £65 per ton are realized. The spiegeleisen market is unchanged at \$75, furnace, there being one inquiry for around 300 tons for domestic consumption. Inquiry from foreign countries continues to be prominent. High grade manganese ore is reported to have sold for early delivery as high as 83c. per unit, seaboard. Ferro-silicon, 50 per cent, is inactive with business confined to some resale lots, as most producers are understood to be sold up to July 1.

Quotations for ferrotungsten or tungsten powder are 85c. to \$1.15 per lb. of contained tungsten. Ferro-vanadium is quoted at \$6.25 to \$7 per lb. of contained vanadium in wholesale lots for early delivery, but these are nominal, the alloy being exceedingly scarce. Small lots for prompt delivery are selling above \$7. Ferrochromium 60 to 70 per cent is quoted at 19c. per lb. of contained chromium in which the carbon is 6 to 8 per cent and about 1c. per lb. higher where the carbon ranges 4 to 6 per cent. Ferrocobaltititanium, 15 to 18 per cent, is selling at \$200 per net ton in carload lots, at \$220 per ton in lots between one ton and a carload, and at \$250 per ton in lots less than a ton, f.o.b. Suspension Bridge, N. Y.

Finished Iron and Steel.—New business in steel products shows a marked falling off, the principal concern of consumers being to get shipments of material already bought. A large motor truck manufacturer in the East has offered to send as many as 600 trucks to a western Pennsylvania steel plant to get material that cannot be obtained by rail. A Staten Island shipbuild-

ing company succeeded in getting through a solid trainload of plates, consisting of 27 cars. A New York consumer brought 300 tons of plates by way of Albany at an additional freight expense of \$2.40 per ton. Some plants are having such great difficulty in getting material that they are considering shutting down until conditions improve. The congestion of finished products at manufacturing plants is one of the worst features of the situation, a great deal of money being tied up. There is no marked softening in prices with the possible exception of plates, and then only in special cases. Some mills will now quote 3.50c. to 3.75c., Pittsburgh, on heavy tank plates or plates which can be rolled on narrow mills. Universal plates are also a trifle weaker. Specialties such as boiler and firebox steel are still firm, however, as plate mills are not anxious for this class of business. The minimum on these grades, and also on ship plates, seems to be 4c., Pittsburgh. Small lots of boiler steel for early delivery have brought as high as 4.50c., Pittsburgh, with full extra. A locomotive company has bought upward of 1000 tons of plates for a Canadian plant and will place orders this week for 2500 tons or more for American plants. Sales of ship plates for shipment to England have been made at 4c., Pittsburgh. The demand for small bars is still insistent, and premium prices are frequently paid where the need is urgent, as for example, 5.50c., base, Pittsburgh, on 100 tons of $\frac{3}{8}$, $\frac{7}{16}$ and $\frac{1}{2}$ in. rounds. The demand for structural shapes, which has been at low ebb in recent weeks, appears to be slightly better, one company having booked close to 2000 tons in the past week at 4c., Pittsburgh. Considerable car business will probably be placed if the financing now being considered by the Government is carried out. At present, there is comparatively little inquiry. The Illinois Central wants 1000 refrigerator cars and 200 flat cars. The Havana Central is in the market for 600 box and flat cars. Orders placed include 1000 steel hopper cars for the Bethlehem Steel Co., taken by the Cambria Steel Co.; 1200 hopper bodies, taken by the Pressed Steel Car Co., and 1000 box car bodies, taken by the Mount Vernon Car Co., the two latter orders coming from the Baltimore & Ohio Railroad. Structural lettings include 600 tons for the General Electric Co., Lynn, Mass., taken by American Bridge Co.; 1800 tons for a coal breaker for the Pennsylvania Coal Co., Dunmore, Pa., taken by the American Bridge Co., and a like tonnage let to an independent fabricator; 300 tons for a pier on Staten Island, and 350 tons for a highway bridge at Asbury Park, N. J., both taken by American Bridge Co. About 1500 tons of steel will be required for reconstruction of the building at 1 Broadway, New York, for the International Mercantile Marine. The Baltimore & Ohio Railroad wants 200 tons for two bridges.

Warehouse Business.—Transportation continues to show a slight improvement, warehouses receiving a few carloads of material shipped before the strike and some shipped quite recently. Great difficulty is encountered in having material delivered from New Jersey to New York because of the dock strike. Prices on galvanized and box annealed black sheets have advanced $\frac{1}{2}$ c. and 1c. per lb. and blue annealed sheets are almost unobtainable. Tire steel is now quoted at 5c. to 5.25c. per lb., New York, with smooth finished at 5.50c. per lb. base. With present mill prices of open hearth spring steel, warehouses are looking for a considerable increase when stocks are exhausted. A buyer of a fair sized order of large sizes of flats recently paid 7.25c. per lb. f.o.b. Pittsburgh. The brass and copper situation is unchanged. We quote prices on page 1422.

High Speed Steel.—Producers still quote \$1.25 to \$1.30 per lb., New York. The price of high speed steel in England recently advanced from 3s. 9d. to 4s. 2d. for 18 per cent tungsten, caused by a stiffening in the price of tungsten. With this price prevailing, it is estimated that the cost of delivery to an American port will be \$1.01 or more.

Cast-Iron Pipe.—Inquiries and orders have slackened somewhat, but makers are satisfied as they will have better chance to catch up in their production. We quote 6-in. and heavier at \$76.30, New York; 4-in., \$79.30, with \$2 additional for Class A and gas pipe.

Old Material.—The only item which has made an appreciable change in price is steel car axles, which have risen about \$3 over a week ago due to a demand for export. Price tendency is downward on most grades, though the undercurrent tone of the market is hopeful. One broker reports better business last week than for some time, though this is the exception. Dealers believe that a slow advance in the price of pig iron will tend to keep up the price of cast scrap.

Buying prices per gross ton, New York, follow:

Heavy melting steel.....	\$19.50 to \$20.00
Rerolling rails.....	30.00 to 31.00
Relaying rails, nominal.....	52.00 to 54.00
Steel car axles.....	39.00 to 40.00
Iron car axles.....	43.50 to 44.00
No. 1 railroad wrought.....	31.50 to 32.50
Wrought iron track.....	22.00 to 22.50
Forge fire.....	16.00 to 16.50
No. 1 yard wrought, long.....	24.50 to 25.00
Light iron.....	9.00 to 10.00
Cast borings (clean).....	17.50 to 18.00
Machine-shop turnings.....	15.50 to 16.00
Mixed borings and turnings.....	15.00 to 15.50
Iron and steel pipe (1 in. min. diam., not under 2 ft. long).....	20.00 to 20.50
Stove plate.....	28.00 to 28.50
Locomotive grate bars.....	28.00 to 28.50
Malleable cast (railroad).....	29.00 to 30.00
Old car wheels.....	36.00 to 37.00

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton:

No. 1 machinery cast.....	\$39.00 to \$40.00
No. 1 heavy cast (columns, building materials, etc.), cupola size.....	38.00 to 39.00
No. 1 heavy cast, not cupola size.....	32.00 to 33.00
No. 2 cast (radiators, cast boilers, etc.).....	31.00 to 32.00

Boston

BOSTON, May 11.

Pig Iron.—The market is less active, but strong and unchanged in price. One firm sold 2500 tons, about half eastern Pennsylvania, silicon 2.25 to 2.75, June, July and August delivery, at \$45 furnace base, and half Virginia, including 1000 tons No. 1 X, last half iron, to a Rhode Island consumer, at \$44 base. A Connecticut foundry bought 1000 tons Buffalo No. 2 plain, No. 2 X and No. 1 X iron, last quarter delivery, at \$2 under the market, but 100 ton lots of silicon 1.75 to 2.25 and silicon 2.25 to 2.75 sold at \$45 furnace base. Other unusual sales reported this week are 100 tons Tennessee high phosphorus prompt shipment iron at \$43 furnace base, one car resale northern prompt shipment charcoal at better than \$60 furnace base, and 100 tons Alabama, silicon 2.75 to 3.25, manganese 0.25 May delivery iron at \$42.75 furnace, a Canadian foundry buying the last. With the exception of Alabama iron, which is coming forward by water, no furnace in the country can ship pig iron into New England without a permit, and the Buffalo furnaces cannot do that. Many foundries in this section of the country have less than 30 days' supply on hand. Delivered prices follow:

East. Penn., sil. 2.25 to 2.75.....	\$48.15 to \$50.65
East. Penn., sil. 1.75 to 2.25.....	46.90 to 49.40
Buffalo, sil. 2.25 to 2.75.....	49.15 to 50.15
Buffalo, sil. 1.75 to 2.25.....	47.90 to 48.90
Virginia, sil. 2.25 to 2.75.....	48.95 to 50.95
Virginia, sil. 1.75 to 2.25.....	47.70 to 49.70
*Alabama, sil. 2.25 to 2.75.....	46.75 to 47.75
*Alabama, sil. 1.75 to 2.25.....	48.95 to 49.95

*Alongside Boston prices.

Ferrosilicon.—Because some foundries are unable to secure pig iron, they are inquiring for ferrosilicon to use in connection with old material, but only a very moderate amount is available owing to the railroad transportation situation. Ground ferrosilicon, however, is obtainable at the usual differential over the lump form.

Warehouse Business.—Cold-rolled steel rounds are \$1 per cwt. higher at \$8, and flats, squares and hexagons at \$8.50. Otherwise iron and steel prices are unchanged. Black sheets are approximately \$1 higher at \$9.50 base, while galvanized sheets are 50c. higher at \$10.50 base. Cap screws have advanced to 20 per cent discount, set screws to 25 per cent discount and machine screws to 40 per cent discount. Small iron rivets are 5 per cent higher at 20 per cent discount and very scarce. A western automobile manufacturer has bought 40,000 stove bolts and 400 gross brass machine screws from a local warehouse jobber. The trade is well sold up on $\frac{1}{2}$ -in. washers and stocks of other sizes

are badly broken. A Worcester wrench manufacturer has advanced prices 10 per cent, and hand pipe cutters are 5 per cent higher.

Jobbers quote: Soft steel bars, \$5.50 base per 100 lb.; flats, \$6 to \$6.35; concrete bars, \$5.50 to \$6; tire steel, \$6.50 to \$7; spring steel, open hearth, \$10; crucible, \$15; steel bands, \$7.25; steel hoops, \$8.25; toe calk steel, \$7.25; cold rolled steel, \$8 to \$8.50; structural, \$5.50; plates, \$6; No. 10 blue annealed sheets, \$8; No. 28 black sheets, \$9.50; No. 28 galvanized, \$10.50; refined iron, \$5.50 base; best refined, \$7; Wayne, \$8; band iron, \$7.25; hoop iron, \$8.25; Norway iron, \$20.

Old Material.—Some dealers adhere to quotations made last week while others, owing to a lack of business, have modified theirs, consequently prices to-day take a wider range. The market for cast shows unmistakable signs of weakening, while stove plate continues to decline under larger offerings. The American Brake Shoe & Foundry Co. has dropped its stove plate buying price about \$4 a ton. Connecticut consumers are still in the market for car wheels at about \$41 delivered, and a Taunton, Mass., foundry wants a car of 70-ton rails. One dealer bought 1000 tons borings and turnings for an eastern Pennsylvania mill at regular dealers' prices, and another continues to pay better than \$20 f.o.b. shipping point for heavy melting steel against a Jones & Laughlin order. Cast iron borings hold up well in anticipation of buying by chemical interests. The market for pipe has become inactive again. Prices quoted at local yards follow:

No. 1 heavy melting steel.....	\$18.00 to \$20.50
No. 1 railroad wrought.....	26.00 to 28.00
No. 1 yard wrought.....	24.00 to 25.00
Wrought pipe (1 in. in diameter, over 2 ft. long).....	20.00 to 21.50
Machine shop turnings.....	14.00 to 15.00
Cast iron borings.....	15.50 to 16.50
Heavy axle turnings.....	16.00 to 17.00
Blast furnace borings and turnings.....	14.00 to 15.00
Forged scrap.....	14.50 to 15.50
Bundled skeleton.....	14.50 to 15.50
Street car axles.....	32.00 to 35.00
Car wheels.....	37.00 to 38.50
Machinery cast.....	38.00 to 40.00
No. 2 cast.....	35.00 to 37.00
Stove plate.....	27.00 to 29.00
Railroad malleable.....	26.50 to 27.50
Rerolling rails.....	28.00 to 29.00

St. Louis

ST. LOUIS, May 10.

Pig Iron.—Considerable small tonnage selling is reported in this market, chiefly by furnaces able to make immediate shipments. Such iron is being handled into East St. Louis and thence trucked to the west side of the river, the switchmen's strike still interfering with deliveries on this side. Furnaces represented here hold their prices at \$42 to \$44, Birmingham basis for southern iron, according to the activity of their desire to sell. No large transactions have taken place and none are indicated at present as all interests are operating cautiously because of the traffic conditions. Fuel difficulties are also causing some trouble in operations, although there has been a little improvement over the conditions prevailing a week ago.

Coke.—Absolutely nothing is being done in coke at this point because of the inability to get cars at the ovens and other transportation problems. Such contract coke as is coming in has to be trucked from team tracks and other points in order to keep foundries and other plants going.

Finished Iron and Steel.—In finished products no general improvement is reported in any marked degree, although a little more material is getting through to consumers and to the warehouses. There is no willingness to make contracts for future delivery and shipments are already so far deferred that there is little or no inducement to make them. Movement out of warehouse continues controlled by the receipts through the switchmen's battle lines and in consequence the demand is far above the delivery.

For stock out of warehouse we quote as follows: Soft steel bars, 3.94c.; iron bars, 4.59c.; structural material, 4.04c.; tank plates, 4.24c.; No. 10 blue annealed sheets, 7.09c.; No. 28 black sheets, cold rolled, one pass, 8.10c.; No. 28 galvanized sheets, black sheet gage, 9.60c.

Old Material.—The scrap market is softer as a result of the continuance of the railroad troubles at terminals and although the movement of freight is slowly improving, there is still such a congestion due to the

troubles of the past month that it will be some time before there can be any great activity in the scrap market. Dealers are still endeavoring to bear the situation with equanimity, but each day indicates greater discouragement with its consequent effect on prices. Transactions do not establish real quotations.

We quote dealers' prices f.o.b. customer's works, St. Louis industrial district, as follows:

Per Gross Ton	
Old iron rails.....	\$32.50 to \$33.00
Old steel rails, rerolling.....	31.50 to 32.00
Old steel rails, less than 3 ft.....	26.00 to 26.50
Relaying rails, standard sections, subject to inspection.....	50.00 to 55.00
Old car wheels.....	34.50 to 35.00
No. 1 railroad heavy melting steel.....	22.50 to 23.00
Heavy shoveling steel.....	21.50 to 22.00
Ordinary shoveling steel.....	21.00 to 21.50
Frogs, switches and guards, cut apart.....	24.00 to 24.50
Ordinary bundled sheets.....	14.50 to 15.00
Per Net Ton	
Heavy axle and tire turnings.....	16.00 to 16.50
Iron angle bars.....	29.50 to 30.00
Steel angle bars.....	22.00 to 22.50
Iron car axles.....	39.50 to 40.00
Steel car axles.....	33.50 to 34.00
Wrought arch bars and transoms.....	31.00 to 31.50
No. 1 railroad wrought.....	25.50 to 26.00
No. 2 railroad wrought.....	23.50 to 24.00
Railroad springs.....	22.50 to 23.00
Steel couplers and knuckles.....	24.00 to 24.50
Locomotive tires, 42 in. and over, smooth inside.....	22.50 to 23.00
No. 1 dealers' forge.....	22.00 to 22.50
Cast iron borings.....	14.00 to 14.50
No. 1 busheling.....	21.50 to 22.00
No. 1 boiler, cut to sheets and rings.....	17.00 to 17.50
No. 1 railroad cast.....	35.00 to 35.50
Stove plate and light cast.....	30.50 to 31.00
Railroad malleable.....	26.00 to 26.50
Agricultural malleable.....	25.50 to 26.00
Pipes and flues.....	17.00 to 17.50
Heavy railroad sheet and tank.....	16.50 to 17.00
Railroad grate bars.....	27.50 to 28.00
Machine-shop turnings.....	13.50 to 14.00
Country mixed.....	19.00 to 19.50
Uncut railroad mixed.....	19.50 to 20.00
Horseshoes.....	24.50 to 25.00

Cincinnati

CINCINNATI, May 11.

Pig Iron.—The local pig iron market remains dull and what inquiry is before the trade comes mostly from southern melters. Sales during the week have not been large, one house reporting an aggregate of 3500 tons, of which 2000 was for this territory. Included in this lot was one of 1000 tons of southern foundry for last half delivery, which went at \$42, Birmingham. Another lot of 400 tons, silicon 2.25 to 2.75, was taken by a nearby melter at \$43.25, Birmingham. A southern Indiana melter took 1000 tons of southern foundry, of which 600 was silicon 1.75 to 2.25 and 400 tons silicon 2.25 to 2.75. The former lot went at \$42, Birmingham, and the latter at \$43.70, the silicon differential being figured at 4 per cent advance for each 50 points. Some Virginia furnaces have advanced their price to \$45, but it is understood that Virginia iron can still be secured at \$43.25. A local seller reports the sale of 950 tons of southern Ohio malleable to a Chicago district consumer at prices ranging from \$46.25 to \$53.25, depending on silicon content. This is a duplicate of a sale reported to the same interest two weeks ago.

Based on freight rates of \$3.60 from Birmingham and \$1.80 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base price).....	\$45.60
Southern coke, sil. 2.25 to 2.75 (No. 2 soft).....	46.85
Ohio silvery, 8 per cent sil.....	59.80
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2).....	46.80
Basic Northern.....	41.80
Malleable.....	\$45.80 to 46.80

Coke.—The railroad situation in southern Ohio is regarded as fairly satisfactory, and no furnaces have been forced to bank owing to non-delivery of fuel. Some of them have been forced to pile a portion of their make, but on the whole shipments have been fairly good. A local seller reports that he has received assurances that coke shipments from the Connellsville field will be resumed on a limited scale to-day, and that several cars which had been held up for some weeks have been started on their way. This will be very encouraging news to pig iron melters in this territory, who have been up against it for coke for some time.

Shipments are being received from the Wise County field at irregular intervals, but very little is being received from the New River district. Connellsville coke for prompt shipment is being quoted at \$13, and for last half year at \$12. While it is difficult to secure quotations from Wise County and New River districts, it is reported that producers are willing to accept \$13 for foundry, though sales of the former have been made in this city at \$15.

Jobbers quote: Iron and steel bars, 5c. to 6c.; structural shapes, 5.10c.; plates, 5c.; steel bands, 6.25c. base; No. 10 blue annealed, 7.50c.; No. 28 black sheets, 7.75c. to 8.75c.; No. 28 galvanized sheets, 9c. to 10c.

Finished Material.—The railroad strike has not yet affected the operation of any of the sheet mills in southern Ohio, all of which are running up to their capacity. One mill is reported to be having difficulty in securing sufficient cars to ship its output, and is forced to pile some of its output, but unless the situation gets extremely bad, it is not believed that it will have to curtail production. The effect of the strike in shutting off the delivery of materials to other cities and the consequent reduced operation of plants, particularly auto body manufacturers, has resulted in a slight falling off in the demand for sheets for this purpose, but this is looked on as only temporary. The demand for bars and wire products is heavy, and some inquiries have been received for light rails from nearby mining companies. Plates and shapes are in moderate demand, though with the settlement of the carpenters' strike it is expected that several building projects temporarily held up on this account will go ahead. There is a heavy demand for screw stock in sizes up to 1 in, and the sale of a fair sized lot is reported at 12½c. for ½-in. stock. A considerable tonnage of tin plate was sold in this territory during the week at \$8 per base box. Warehouses report business still very brisk, with shipments fairly good. Prices are the same as quoted last week. The scarcity of material of all kinds was illustrated during a sale of surplus material at the Government warehouse at Dayton last week, when prices averaging about 2c. above the market were bid for all steel bars offered. The sale attracted buyers from all over the country, and the bidding was lively. Work on the construction of the Southern Railroad bridge over the Ohio River, the steel work of which was awarded to the American Bridge Co., will likely commence early this summer. Contracts for the pier construction have not yet been awarded. The steel work for the new buildings of the Anderson Foundry & Machine Co., Anderson, Ind., involving several hundred tons, is understood to have gone to an Indiana company.

Old Material.—The scrap market remains stagnant, the impossibility of shipping to steel producing centers being given as the cause. Some inquiry is reported for cast scrap, mostly from local foundries, and this is being moved by truck. In the absence of sales, prices quoted below are nominal.

We quote as follows:

Per Gross Ton	
Bundled sheets.....	\$16.00 to \$17.00
Old iron rails.....	27.00 to 28.00
Relaying rails, 50 lb. and up.....	48.00 to 49.00
Rerolling steel rails.....	29.00 to 30.00
Heavy melting steel.....	21.50 to 22.50
Steel rails for melting.....	24.00 to 25.00
Car wheels.....	29.00 to 30.00
Per Net Ton	
No. 1 railroad wrought.....	\$25.00 to \$26.00
Cast borings.....	11.50 to 12.00
Steel turnings.....	9.50 to 10.00
Railroad cast.....	31.00 to 32.00
No. 1 machinery.....	35.00 to 36.00
Burnt scrap.....	22.00 to 23.00
Iron axles.....	29.50 to 30.00
Locomotive tires (smooth inside).....	23.50 to 24.50
Pipes and flues.....	17.00 to 17.50
Malleable cast.....	22.00 to 22.50
Railroad tank and sheet.....	16.00 to 16.50

Improving at Youngstown

YOUNGSTOWN, May 11.—Traffic on all the principal trunk lines serving the district is improving, and newly formed switching crews are engaged removing a heavy accumulation of finished steel. Railroad operating heads promise a better movement of raw materials by the end of the week. Manager W. A. Baldwin, of the Erie, states normal pre-strike conditions are rapidly being realized.

Cleveland

CLEVELAND, May 11.

The railroad situation in this territory is as bad as a week ago, and with the prolonged curtailment of traffic general conditions in some respects are worse. The local situation has been made more serious by a strike yesterday of 200 Pennsylvania Railroad freight brakemen and conductors. The American Steel & Wire Co. is now operating three out of five blast furnaces in Cleveland and has its steel and finished plants in full operation. All the other local steel plants are running. Cleveland mills and blast furnaces are able to make some shipments, but mostly in train load lots for straight road hauls. Mills are able to ship some carload lots by trucking the material from the plants to the railroad loading platforms. However, production continues to pile up as the mills are unable to ship but a portion of their output. Jobbers are unable to get railroads to accept as many shipments as a week ago. Some steel in train load lots is coming from the Pittsburgh district, and the Baltimore & Ohio railroad is handling trainload lot shipments in fair shape from Johnstown, Pa., to Ohio points. Most Cleveland manufacturers continue to operate their plants by using their surplus stocks, but at reduced capacity, and can ship but little of their product. Some relief of the local situation was afforded yesterday by loading of a Lake freighter with steel, wire, machine tools and other products for shipment to Chicago and Milwaukee. Other Lake boats are expected to be placed in this service. The Struthers Furnace Co. started its furnace at Struthers, Ohio, today. The United Alloys Steel Corporation, Canton, is operating four open-hearth furnaces, as compared with three a week ago. Valley tank shops are still running and have accumulated a large amount of products which they cannot ship.

Iron Ore.—The situation is growing worse at the lower Lake docks owing to a strike of the switchmen on the Bessemer & Lake Erie Railroad operated by the Steel Corporation, which has entirely stopped the handling of ore at Conneaut. There is a bad congestion at other docks that are being operated, and it is expected that conditions will grow worse, as there will be a scarcity of cars because empty cars are not being brought back when ore is unloaded at destination. Most of the ore that is being received is going to Lake front furnaces. More ore is being loaded at upper Lake docks this week than last week, but shippers expect considerable delay in unloading. The Pennsylvania dock in Cleveland is now handling one cargo of ore a day as compared with a normal capacity of four cargoes when sufficient cars are available. There has been considerable chartering of wild vessel tonnage of ore during the past few days at regular contract rate. Some of the vessel owners have been declining to take contracts, expecting that wild cargoes would bring higher rates than the regular contract rates. On May 1 the ore balance on lower Lake docks was 6,204,556 gross tons as compared with 5,686,188 on the same date a year ago. Shipments from docks during April were 1,385,848 tons as compared with 1,447,337 tons during April, 1919.

We quote, delivered, lower Lake ports: Old range Bessemer, \$7.45; old range non-Bessemer, \$6.70; Mesaba Bessemer, \$7.20; Mesaba non-Bessemer, \$6.55.

Pig Iron.—There is a fair demand for foundry iron for early shipment and some furnaces are able to book orders for prompt delivery because they cannot make shipments to their regular customers. Some furnaces are able to ship about all their iron, but others can ship only a little. Locally the situation shows little improvement, although Cleveland furnaces were able to ship a little iron last week as compared with none the week before. Prices have further stiffened and little foundry iron is now available at \$43 for 1.75 to 2.25 per cent silicon. Most sales are at \$44 for No. 2 for the last half and \$44 to \$45 for early shipment. Cleveland furnaces are now on a \$45 basis for early shipment iron, and we note the sale of one lot of 500 tons at that price. However, a sale of two car lots of 1.75 to 2 per cent silicon iron is reported to have been made by a Valley furnace at \$42.50. A Cincinnati broker is

inquiring for 20,000 tons of basic iron for St. Louis delivery for the last half. The financial situation growing out of the strike is causing anxiety among some furnace interests. The piling of iron means the tying up of a large amount of capital and it is pointed out that some consumers, even if they are able to secure their pig iron, cannot ship their castings and consequently may have difficulty in meeting their obligations for pig iron.

We quote, delivered Cleveland, as follows, based on switching charge for local iron, a \$1.40 freight rate from Valley points and \$5 from Birmingham:

Basic	\$43.40
Northern No. 2 foundry, sil. 1.75 to 2.25	\$44.40 to 45.40
Southern foundry, sil. 2.25 to 2.75	48.70
Gray forge	41.40
Ohio silvery, sil. 8 per cent	61.40
Standard low phos., Valley furnace	48.00 to 50.00

Finished Iron and Steel.—Demand for finished iron and steel is very light. Consumers are turning their attention to efforts to secure shipments on contracts. Considerable inquiry has come from implement manufacturers for third quarter and last half contracts, but mills are not yet taking on this business. There is a fairly heavy volume of inquiry for billet and sheet bars for export, and a Cleveland mill has taken an export order for 5000 tons for open-hearth billets at \$75 for May and June shipment. Prices are well maintained at 4c. for steel bars, plates and shapes for early shipment, and one mill has taken an order for 300 tons of structural material at that price. Consumers, however, show little disposition to purchase at top prices except for early requirements. Practically no building work is coming up owing to the high cost and scarcity of material. The American Bridge Co. has taken 500 tons for a plant extension of the Ohio Brass Co., Mansfield, Ohio. Some sheet business is being placed for early shipment and the third quarter at 6c. to 6.25c. for blue annealed and 8c. for black.

Cleveland warehouses quote steel bars at 3.27c. to 5c.; plates, 3.57c. to 5c., and structural material, 3.70c. to 5.10c.

Bolts, Nuts and Rivets.—Bolt and nut makers are operating at from 50 to 75 per cent capacity because of the lack of steel, and their stocks are getting very low. Some will probably be forced to shut down within 10 days unless the situation is relieved. Manufacturers are able to ship only a small portion of their product. Some of the makers who have been adhering to the old discounts have marked up their prices and they state that old prices have about disappeared on machine and carriage bolts except for larger sizes.

Old Material.—The scrap market is almost at a standstill, and dealers make little effort to make sales. The only activity reported is the purchase by a Cleveland consumer of 6000 to 8000 tons of heavy melting steel at \$24, or 50c. lower than it had been paying recently, and about the same tonnage of blast furnace turnings at \$17.

Dealers quote delivered consumers' yards in Cleveland and vicinity as follows:

Heavy melting steel	\$23.50 to \$24.00
Steel rails under 3 ft.	25.00 to 27.75
Steel rails, rerolling	31.00 to 32.00
Iron rails	32.00 to 33.00
Iron car axles	41.00 to 42.00
Steel car axles	36.00 to 37.00
Low phos. melting scrap	26.25 to 26.50
Cast borings	17.00 to 17.25
Iron and steel turnings and drillings	13.50 to 14.00
Short turnings for blast furnaces	17.00 to 17.25
Compressed steel	18.50 to 19.00
Railroad wrought	28.00 to 29.00
Railroad malleable	31.00 to 32.00
Steel axle turnings	19.50 to 20.00
Light bundle sheet scrap	15.00 to 15.50
Drop forge flashings over 10 in.	17.00 to 17.50
No. 1 cast	41.00 to 42.00
No. 1 busheling	18.50 to 18.75
Railroad grate bars	29.00 to 30.00
Stove plate	29.00 to 30.00

Goshen Furnace Purchased

PHILADELPHIA, May 11.—The Goshen Furnace Corporation has purchased the blast furnace property at Goshen, Va., from the Southeastern Iron Corporation. The furnace is now being relined, and it is expected will be in blast within the next few weeks. W. A. Barrows, III, will be in charge of the operation, with headquarters at Goshen. This furnace was originally built in 1881, and has since been rebuilt and considerably improved.

Philadelphia

PHILADELPHIA, May 11.

Entanglements in shipping are now complicated by a crowded situation that is growing in seriousness. The railroad tie-up, in fact, has been responsible in no small degree in straining the money situation, and both are having their effect on the iron and steel markets. A great deal of money is held up in finished products that cannot be shipped. Complaints are numerous that the banks are refusing ordinary accommodations. With liquidated capital tied up in undelivered goods, many manufacturers are not in a mood to do buying. And, moreover, there is apparently a feeling that it is useless to buy more iron and steel when it is so difficult to obtain that which has already been contracted for. The iron and steel market, therefore, has had a very quiet week, inquiries being few and orders fewer. Relief from the present situation can come only, it is held, from better railroad service and consequently there is considerable interest in the measure before Congress to appropriate funds for freight cars. In the past week the railroad situation has shown improvement in some directions, while in others the conditions are described as worse. Blast furnaces are again having trouble in getting sufficient supplies of coke and several have been obliged to slow down to avoid banking. Railroad embargoes change from day to day. When one railroad removes embargoes another puts one on, so that the steel mills and blast furnaces are finding it extremely difficult in getting out shipments.

Pig Iron.—The market is quiet, but prices are firm, especially so on foundry grades. Sales have been made by eastern furnaces on the basis of \$47, furnace, for 1.75 to 2.25 per cent silicon, and the minimum appears to be \$45, furnace. There is very little buying, and such as there is is mostly for prompt delivery. Consumers are chiefly concerned, however, in getting iron already under contract. The railroad tie-up is again making it difficult for blast furnaces to obtain sufficient coke. Several eastern stacks have been obliged to slow down, though none is reported to have banked. Furnace operators and sales agents do not look for any advance in pig iron prices this year and, in fact, some are predicting that the next buying movement will carry foundry iron up to \$50.

The following quotations are for iron delivered in consumers' yards in Philadelphia or vicinity, except those for low phosphorus iron, which are f.o.b. furnace:

East. Pa., No. 2 X, 2.25 to 2.75 sil., \$47.05 to \$49.35	
East. Pa., No. 2 plain, 1.75 to 2.25 sil., 45.80 to 48.10	
Virginia No. 2 plain, 1.75 to 2.25 sil., 47.35 to 48.10	
Virginia No. 2 X, 2.25 to 2.75 sil., 49.35	
Basic deliv., eastern Pa., 44.80	
Gray forge, 43.00 to 44.00	
Standard low phos. (f.o.b. furnace), 50.00	
Malleable, 46.75	
Copper bearing low phos. (f.o.b. furnace), 47.00	

Ferroalloys.—Spot ferromanganese in carload lots has been sold in the past week at \$240 to \$250 delivered. For second half \$200 delivered is still quoted. Spiegeleisen appears to be firm at \$75, furnace, the price named by two leading producers.

Semi-finished Steel.—There is very little buying in semi-finished material. One producer of open-hearth rolling billets continues to sell small lots at \$60 to \$65 Pittsburgh, while another asks and has been getting \$70 Pittsburgh.

Plates.—Plate manufacturers report the coal situation is slightly better, but it is very difficult to make shipments of finished material and mill schedules are accordingly affected, as it is the policy of the mills to roll only what can be delivered. One eastern plate mill has not been able to get its production above 50 per cent in the past week. Inquiries for locomotive plates are in the market, material being required for 50 to 60 locomotives. Another inquiry calls for steel for eight boats. On small lots of tank plates and on specification plates, the market still appears to be fair at 4c., Pittsburgh, but heavy tank steel has been sold at 3.75c. and as low as 3.50c. has been admitted as a possibility. No large volume of business is being done, consumers generally remaining out of the market.

Coke.—Furnaces would gladly pay almost any price

within reason for spot coke, but it is impossible for the operators to guarantee shipment. It is reported that as high as \$12.50 per ton, Connellsville, has been paid for spot coke. Operators are again willing to accept contracts for last half, based on the price of basic pig iron in the Valley. One such contract was made on the basis of four and one-half tons of coke to a ton of pig iron. Based on the present quotations of \$43 for basic, the coke would cost slightly over \$9.50 per ton.

Structural Material.—The market is quiet, due largely to lack of building work in this locality. Not much new business is being put on the books, but such orders as are taken by eastern mills are generally on the basis of 3.75c. to 4c., notwithstanding reports of lower prices by Pittsburgh mills.

Bars.—There is a continued good demand for bars, both steel and iron. One inquiry for steel bars of 2500 tons was turned down by an eastern mill which could have made the delivery, but the business was not desired because of some small sizes specified. One company is still taking a little business for second quarter at 4c., Pittsburgh. Bar iron is still quoted on the basis of 4c., Pittsburgh.

Old Material.—In the past week demand for scrap has been slightly better, but the market is far from active. Prices are off 50c. or \$1 a ton on some grades, and it is probable that even lower prices would prevail were it not for the railroad embargoes which prevent shipments of old material from New England. There is said to be a large accumulation of scrap in that district, turnings, in particular, being in good supply. When this scrap moves to consuming points lower prices are looked for. On the other hand, it is pointed out that eastern mills probably will need scrap in the near future, as they have not been buyers in some time. An eastern mill bought machine shop turnings last week at \$18.50, delivered. We quote delivered:

No. 1 heavy melting steel.....	\$23.50 to \$24.00
Steel rails rerolling.....	32.00 to 33.00
No. 1 low phos., heavy 0.04 and under.....	30.00 to 31.00
Car wheels.....	40.00 to 41.00
No. 1 railroad wrought.....	34.00 to 35.00
No. 1 yard wrought.....	27.00 to 28.50
No. 1 forge fire.....	19.00 to 19.50
Bundled skeleton.....	19.00 to 19.50
No. 1 busheling.....	22.00 to 23.00
No. 2 busheling.....	17.50 to 18.50
Turnings (short shoveling grade for blast furnace use).....	18.00 to 19.00
Mixed borings and turnings (for blast furnace use).....	17.50 to 18.00
Machine-shop turnings (for rolling mill and steel works use).....	18.50 to 19.50
Heavy axle turnings (or equivalent).....	20.00 to 21.00
Cast borings (for rolling mills).....	20.00 to 21.00
Cast borings (for chemical plants).....	22.50 to 23.50
No. 1 cast.....	38.00 to 40.00
Railroad grate bars.....	29.00 to 30.00
Stove plate.....	28.50 to 29.50
Railroad malleable.....	29.00 to 30.00
Wrought iron and soft steel pipes and tubes (new specifications).....	24.00 to 24.50
Iron car axles.....	45.00 to 46.00
Steel car axles.....	42.00 to 44.00

Michigan Manufacturers' Association

DETROIT, May 11.—At their annual meeting in Detroit, Tuesday, May 4, the Michigan Manufacturers' Association elected the following officers: President, S. C. Whitney, secretary-treasurer Muskegon Motors Specialties Co., Muskegon; first vice-president, F. W. Hutchings, treasurer Charcoal Iron Co. of America, Detroit; second vice-president, Arthur B. Williams, secretary Postum Cereal Co., Battle Creek; treasurer, M. J. Murphy, president the Murphy Chair Co., Detroit. All members of the board of directors were re-elected, and the size of the board was increased by the election of A. R. Demory, president Timkin-Detroit Axle Co., Detroit; C. L. Spence, general manager National Carbon Coated Paper Co., Sturgis; C. F. Bement, general manager Novo Engine Co., Lansing, and George P. Wigginton, president Loose Leaf Binder Co., Kalamazoo. At the annual dinner, which was held in the evening, the association was addressed by Charles Piez, president Link-Belt Co., Chicago, formerly director-general of the Emergency Fleet Corporation. He declared that, if this country would follow a sane course in taxation, legislation and the treatment of labor, despite troublesome times ahead, there would be no panic. But he advised that caution be displayed by business men.

IRON AND INDUSTRIAL STOCKS

Nervousness Among Security Owners Is Less Pronounced Than a Week Ago

Some of the nervousness among owners of securities, visible a week ago, appears to have been lost notwithstanding the irregularity of prices of late. Average prices for securities rule higher than they did a week ago, those quoted for the leading steel and equipment companies being noticeably so.

It is difficult to analyze the change in sentiment among owners of securities. To be sure, the money situation is easier, but temporary only, and the Federal Reserve Bank statement on the credit situation certainly is not cheerful. The latest crop reports are anything but optimistic, and there appears to be definite indication of lower prices for commodities. Silver and lead values are tending downward and those on some other metals are by no means strong.

There has been some selling of Republic Steel of late on the strength of the transportation situation curtailing shipments in the Youngstown district, but Republic is no differently situated in this respect than other steel producers are.

The range of prices on active iron and industrial stocks from Tuesday of last week to Wednesday of this week was as follows:

Allis-Chalm. com.	35 - 37	Lackaw. Steel....	76 - 82
Allis-Chalm. pf....	75 - 76	Lake Sup. Corp..	15½ - 16½
Am. Can. com....	40 - 44	Midvale Steel....	43¾ - 46
Am. Can. pf.....	90¾ - 91	Nat.-Acme	36 - 36¾
Am. C. & F. com.	130¾ - 135¾	Nat. E. & S. com.	71 - 75½
Am. C. & F. pf....	110¾ - 110¾	N. Y. Air Brake.	95¾ - 100
Am. Loco. com....	93 - 97½	Nova Scotia Steel.	58 - 61
Am. Steel F. com.	41¼ - 45¾	Press. Steel com.	97½ - 102¾
Am. Steel F. pf....	— - 90	Ry. Stl. Spg. com.	94 - 95¾
Bald. Loco. com..	113½ - 121½	Ry. Stl. Spg. pf..	— - 99¾
Bald. Loco. pf....	— - 100	Replogle Steel....	87 - 92½
Beth. Steel com..	91¾ - 96¾	Republic com....	93¾ - 99¾
Beth. Stl., Cl. B.	91¾ - 98	Republic pf.....	95 - 96½
Beth. Stl., 8% pf.	100 - 109	Sloss com.....	68 - 70½
Case, J. I., pf....	— - 94½	Sloss pf.....	— - 91
Chi. Pneu. Tool..	89 - 89½	Superior Steel....	48½ - 51
Colorado Fuel....	35 - 35¾	Transue-Williams.	54 - 55
Cru. Steel com....	134 - 148	Un. Alloy Steel..	42¾ - 44½
Cru. Steel pf....	— - 96	U. S. Pipe com....	17½ - 18
Gen. Electric....	141¼ - 143	U. S. Pipe pf....	— - 50
Gt. No. Ore. Cert.	35 - 37	U. S. Steel com..	93¾ - 97½
Gulf States Steel.	58 - 60¾	U. S. Steel pf....	107½ - 108
Gulf S. Stl. 1st pf.	— - 90¾	Vanadium Steel..	76¾ - 83½
Int. Har. com....	122½ - 129	Va. I. C. & Coke.	102 - 112
Int. Har. pf.....	— - 109¾	Westingh. Elec...	48¾ - 49¾

Scrap Dealers Fined for Conspiracy Against the Government

In the Federal Court at Boston, May 5, pleas of not guilty were changed to admissions of guilt by John B. Birmingham, formerly general foreman, reclaiming plant, New York, New Haven & Hartford Railroad, South Braintree, Mass., and William Natt and Henry L. Exstein, both of New York, employees of Joseph Joseph & Bros. Co., New York, old material dealers. The charge was conspiracy to defraud the Government. Birmingham and Natt paid fines of \$5,000 each and Exstein a fine of \$2,000.

Technically there were two indictments against the three men, but they were tried on one only, the other being dismissed. The same two indictments also applied to Eli Joseph, president Joseph Joseph & Bros. Co., but he never was brought to trial. He was in Europe when the indictments were returned. Indictments against him have been nolleed and dropped. The Joseph Joseph & Bros. Co. was not connected with the case.

Joliet Rolling Mill Co. Plant Sold

The Joliet Forge Co., Joliet, Ill., has concluded the purchase of the plant of the Joliet Rolling Mill Co. in that city from Frederick Cowin & Co., Chicago. The mill is equipped with four double puddling furnaces, a billet heating furnace, two reverberatory heating furnaces, a 22-in. and 12-in. bar mill, and has a capacity of 25,000 tons of bar iron annually. The new owner will install an open-hearth furnace and roll steel only.

Lorenzo Pike, mechanical and electrical engineer and factory manager High Grade Lamp Co., Salem, Mass., has become associated with the Lensdale Machine Shop, Southbridge, Mass., as efficiency expert.

JAPANESE SITUATION WORSE

Material for Japan Offered Here—Europe Wants Tin Plate, Billets and Ship Plates—Germany Active

According to advices received by several exporters to Japan, conditions there are growing worse instead of better and the prospect of an early recovery is remote. Of the material recently offered by various exporters to Japan there is probably a total of about 50,000 tons, one of the largest offers being about 6700 tons, but as most of the material offered was purchased from mills for delivery c.i.f. Japan, it cannot be consumed in this country. Recent losses in the Tokio stock exchange totaled about two billion yen, but were confined chiefly to food and textile speculators. The Japanese, who have cancelled orders wherever possible, will probably receive, in the opinion of one exporter, about 50 per cent of present orders within the life of the credits and with no new buying will face a shortage of material in a few months.

The first large inquiry for ship plates from Japan since the recent financial troubles comes from the New York office of one of the largest Japanese shipbuilding companies. It calls for 7200 tons, but there is some questions as to whether the business will be placed at the prevailing high prices.

The European Situation

In European markets, Portugal and Sweden have recently livened up for tin plate for the packing industry of both countries, but Italy continues to refrain from buying, although inquiries are received with requests for credits of a year or more with back guarantees. Pig iron is about the largest item with exporters to Europe, both Holland and Sweden buying small quantities. An exporter recently shipped 1000 tons of foundry iron to Rotterdam, the ultimate destination of which was evidently Germany and another has sold 550 tons with prospect of a follow up order of six to seven thousand tons more. Germany manifests increasing activity in trade with other countries, selling small orders in Japan and South American markets, particularly Argentina, the heaviest buyer at present in Latin America. Inquiries have been received from this source for small quantities of pipe, plates and pig iron.

Although European buyers continue to inquire for billets, the high prices usually prevent business. The same condition exists in spiegeleisen since the recent increase in price. There has been a good demand for ship plates from Great Britain, several good-sized lots having been sold at 4c., Pittsburgh. An order is about to be closed with a Glasgow, Scotland, shipbuilder for 3000 tons at 3.95c., Pittsburgh.

Despite the many difficulties of trade with European markets, an exporter in New York says that he is swamped with inquiries and small orders. Exporters are shipping very little material owing to the difficulties in getting cars through from the mills. One large export company is arranging for solid trainloads to be shipped to tidewater.

The demand for pig iron in Japan in 1919, according to recently compiled statistics was about 973,000 tons, while the production was about 920,000 tons. The heavy consumption of pig iron in England and the United States prevented Japan from importing heavily from these sources.

The tin plate market in Japan is rising. There is an increasing demand and a shortage accelerated by the exportation of tin plate to Spain and France. Current prices in March, according to the *Japan Weekly Chronicle*, were yen 50 for 170 lb. weight and about yen 25.50 for 100 lb. weight. With the yen at 52.50c. to the dollar, this is \$26.25 and \$13.38 respectively.

The engineers in the steam process departments of the Steel Co. of Canada, Hamilton, Ont., are on strike. The blast furnaces and open-hearth furnaces are now idle, but the departments operated by electricity are in operation.

British Iron and Steel Market

Advance in Pig Iron and Some Finished Steel— Tin Plates Easier

(By Cable)

LONDON, ENGLAND, May 11.

Cleveland pig-iron producers have advanced foundry and forge iron prices 17s. 6d. No. 1 foundry iron is now 230s. and No. 3 iron 217s. 6d. for the home trade with the usual 5s. per ton extra for export to the Allies. Hematite iron is unchanged with makers heavily sold.

The steel market is strong, due partly to the strikes in Scotland. On angles and beams an advance of £1 has been made and on sheets an advance of £3 10s. to £4 according to gage. Belgium has been offering beams in this market but has now withdrawn the offerings. The tin plate market is easier, owing to the decline in the price of tin; prompt delivery has sold at 73s., basis, f.o.b. Black sheets, 24 gage, are quoted at £51 with £54 asked for 26 gage, both August-September delivery.

We quote per gross ton, except when otherwise stated, f.o.b. maker's works, with American equivalent figured at \$3.86 for £1, as follows:

	£	s.	£	s.	
Ship plates	26	0 to 32	0		\$101.36 to \$123.52
Boiler plates	28	10 to 35	0		110.01 to 135.10
Tees	25	10 to 33	0		98.43 to 127.38
Channels	24	15 to 33	5		95.53 to 128.34
Beams	25	10 to 32	0		98.43 to 123.52
Round bars, ¾ to 3 in.	27	0 to 35	0		104.22 to 135.10
Rails, 60 lb. and up.	23	0 to 25	0		88.78 to 96.50
Billets	25	10 to 26	10		98.43 to 102.29
Sheet and tin plate bars,					
Welsh	31	0 to 35	0		119.66 to 135.10
Galvanized sheet, 24 g.	56	0 to 60	0		216.16 to 228.60
Black sheet, 24 g to 26 g.	51	0 to 54	0		196.86 to 211.44
Tin plate, base box.	3	12 to 3	14		13.88 to 14.24
Steel hoops	34	15 to 35	0		134.13 to 135.10
Cleveland basic iron.	10				40.50
West Coast hematite.	14	5			55.00
Cleveland No. 3 foundry (ex-					
port to allies).	10	5			40.56
Ferromanganese	35	0 to 40	0		135.10 to 154.40
Coke	2	15½			10.71

Higher Excess Profits Tax Proposed—Sheffield Steel Makers Co-operate—Australian Steel Bars Sold

LONDON, England, April 26.—An event of some importance here recently was the introduction of the budget which was put before the House of Commons a week ago. Naturally there is a lack of unanimity in opinion regarding it, but generally speaking it has been received as favorably as could be expected for any budget which continues to levy heavy taxation on all classes. On one point, however, opinion is decidedly adverse, and that is the proposed increase in the excess profits duty from 40 per cent. to 60 per cent. Meanwhile, however, until things are settled, the tendency has been for this to render commercial interests cautious, and for that reason there has not been as much enterprise in business generally.

In the Cleveland pig iron market conditions continue very much as they were, while the possibility of a further advance in prices adds to the perplexities. It was expected that makers would have already put up prices, owing to the increases in the costs of labor and material. Nothing, however, has been done, and it is now believed that makers will wait, and put on an advance large enough to cover increased fuel costs which are expected to follow the increase of wages to the miners. An important feature in the meantime is that the old and much objected to price-clause has been re-introduced, making any advances payable on all undelivered portions of contracts. As a consequence nobody knows exactly how much they may have to pay eventually for their iron. However, as the demand is so keen, the condition is accepted as a necessary evil so far as the home trade is concerned.

As to export business, matters are different, as buyers abroad insist upon firm quotations. This, however, just at present does not matter much, because

there is practically no iron obtainable for shipment owing to the pressure of the home demand. Added to that is the fact that the inquiry from abroad is not quite as keen as at one time. In hematite there is little to be obtained for any delivery over this month or May, and makers are reluctant to commit themselves for June or beyond.

The deliveries of foreign ore are coming forward well, while the freight, Bilbao-Middlesbrough, tends downwards. Consumers, however, are inclined to hold off. The increasing costs of production in Spain may partly offset the advantage of the lower freight rates.

The steel market is exceedingly strong. Costs of production are constantly increasing and it looks as if quotations had not yet reached the top. The market, however, seems lately to have been a little quieter. This is believed to be partly the result of the budget proposals which have had a depressing effect. In other markets similar symptoms are seen and it is admitted that the demand is not so large as a few weeks ago. This is partly due to exchange difficulties where export trade is concerned, while in the home market buyers are more reluctant to contract for a long period ahead. In view, however, of the well booked conditions of work, makers are indifferent to the falling off, which will quite likely be only temporary. There is a general scarcity of all kinds of finished material, more especially plates, billets and angles. An interesting point is that Australian steel bars are reported to have been sold on c. i. f. terms for direct shipment from Sidney.

An important company has just been formed under the title of Shipbuilding and Associated Industries, Ltd., with a nominal capital of £20,000,000, the object being to promote, organize, co-ordinate, direct and finance shipbuilding, shipping, steel, armament, blast furnace, motor-car, aircraft, mining, engineering, manufacturing and allied or subsidiary undertakings and operations. The first directors are Sir George B. Hunter, T. E. Thirlaway and Earl Grey.

It is also reported that a number of important steel companies in Sheffield have entered into closer co-operation to enable them to increase output. The undertakings concerned are Goodwin & Co., steel and tool manufacturers; Slack Sellars & Co., saw manufacturers; Apex Steel Co., steel manufacturers; Neepsend Rolling Mills, steel rollers; Loxley Forge and Hill-foot Forge, forgers and tilers. These firms will now be in the advantageous position of controlling the manufacture of high grade steel from the raw material to the finished tools.

Pulaski Furnace Co. Sold to Pocahontas Fuel Co.

The Pocahontas Fuel Co., 1 Broadway, New York, has purchased the stock of the Pulaski Iron Co., Pulaski, Va., and at a meeting of the board of directors of the Pulaski Iron Co., on May 10, Isaac T. Mann, president Pocahontas Fuel Co., was elected president, succeeding Col. Horace L. Haldeman, who has been associated with the company for many years, and has resigned on account of ill health, disposing of his entire interest. Percival Johnson, who has been general manager of the Pulaski property, with headquarters at Pulaski, Va., was elected vice-president, and will now make his headquarters at the selling office of the company, Real Estate Trust Building, Philadelphia. Mr. Johnson succeeds B. Frank Hiestand as vice-president.

The Pulaski furnace is capitalized at \$450,000, but its book value exceeds this amount several times. The property consists of one stack, the daily capacity of which is 250 tons, and for years high grade iron has been made; also 4000 acres of Pocahontas coal land and 448 beehive ovens, the latter at Eckman, W. Va.

Under the new incorporation the business will be conducted as heretofore. Mr. Johnson will have charge of sales. Colonel Haldeman will retire from active business and devote some time to the restoration of his health.

Non-Ferrous Metals

The Week's Prices

Cents Per Pound for Early Delivery

	Copper		Tin	Lead		Spelter	
	New York	Electro-lytic	New York	New York	St. Louis	New York	St. Louis
May 5	19.25	19.25	58.00	8.75	8.40	8.20	7.85
6	19.25	19.25	56.50	8.75	8.40	8.20	7.85
7	19.00	19.00	57.20	8.50	8.15	8.20	7.85
8	19.00	19.00	57.20	8.50	8.15	8.20	7.85
10	19.00	19.00	55.50	8.50	8.15	8.20	7.85
11	19.00	19.00	56.25	8.50	8.15	8.15	7.80

NEW YORK, May 11.

The demoralization in the transportation situation of the country is having a depressing effect upon all the markets. Buying of copper is light and there has been a slight revision downward in prices. The only activity has been in tin where purchases of future shipments by dealers have been fairly heavy, but there has been a decided fall in values. The price of lead has also dropped considerably and demand is only fair. The zinc market is stagnant with prices a little lower. Demand for antimony is light and prices have declined.

New York

Copper.—Leading producers have slightly revised their quotations and electrolytic copper for early delivery can be obtained from 19c. to 19.25c., New York. Quotations for Lake copper are on the same level. There is only a light demand from domestic consumers but there continues to be sales of fair proportions to foreign countries. It is estimated that under the new financial arrangements France will absorb around 8000 net tons per month. It is also understood that other foreign countries have been extended similiar financial arrangements to facilitate their purchases here. The statistical position of the market is recognized as exceedingly good while the trade outlook is also excellent if further labor troubles do not develop. The outside market, while less prominent, still exists with quotations around 18.75c., New York. While it is recognized that stocks have been considerably depleted in the last few months, it is also acknowledged that production has been curtailed to a large extent.

Tin.—The feature of this market has been the drastic decline in London the middle of last week, due almost entirely to speculative operations. As a result there has been active buying in the New York market in which mostly dealers participated. Consumers do not seem to be interested and there is no question that the consumption of tin has been extensively curtailed with some mills closed down and others seriously interfered with by labor and transportation difficulties. The sales referred to were transacted on the New York Metal Exchange and on last Wednesday are estimated to have amounted to 300 tons, on the next day to 100 tons and on the next day to 425 tons, mostly for future shipment at prices ranging from 55.87½c. to 58c. There was also some selling of metal previously bought. Yesterday there were further sales of around 225 tons at a price averaging around 55c. While most consumers are at present pessimistic some of them are manifesting more interest since yesterday's trading. Spot Straits tin, as indicated above, fell in the week 5c. per lb. and to-day is quoted at 56.25c., New York. The quotation in London to-day for spot Straits is £312 per ton. Arrivals thus far this month have been 2210 tons and there is reported afloat 4270 tons.

Lead.—Quite unexpectedly late last Friday, May 7, the leading interest reduced its price ¼c. per lb. to 8.25c., St. Louis, or 8.50c., New York, for early delivery. Two reasons are advanced in the trade for this sudden reduction. One is that the London market broke late last week so as to permit of importations in this country of lead at a price that would include the duty and cut under that of the leading interest which was then 9.25c., New York, the outside market having been at the same time 8.75c., New York. The reduction is said to have been decided upon to prevent the dumping here

of too much foreign lead. Another reason advanced is that because transportation difficulties at present interfere with deliveries of the metal on contract a reduction in the price will permit the buying of ores at a low figure. It is stated that, at the present price, Mexican lead can still compete with the domestic product. It is also interesting to note that a factor which might influence buying from Europe is that conditions are such that prompt shipment from Europe is sure to arrive here in June, whereas deliveries here are uncertain. We quote the market at 8.15c., St. Louis, or 8.50c., New York, for early delivery. There is still a fair inquiry for prompt shipment but very little metal obtainable, those having it apparently desiring to keep it or dole it out in retail lots. For this position from 8.75c. to 9c. could be realized.

Zinc.—The market is practically unchanged with prime Western slightly lower at 7.80c., St. Louis, or 8.15c., New York, for delivery into July. These quotations are largely nominal. There is almost no demand, business being confined to small lots. Neither consumers or sellers are interested and the market is stagnant. Conditions in the London market continue to have a marked influence on this side, which is one cause for the lower quotations. There is a fair business being done in brass special and high grade zinc.

Antimony.—Wholesale lots of the better grades for early delivery are quoted at 10c., New York, duty paid, with the lower grades around 9.50c. to 9.75c.

Aluminum.—Wholesale lots of virgin metal for early delivery are quoted at 33c., New York, by the leading producer but could be bought from other sellers at around 31.50c.

Old Metals.—Not much business was transacted this week and prices are generally unchanged. Dealers' selling prices are nominally as follows:

	Cents Per Lb.
Copper, heavy and crucible	19.00
Copper, heavy and wire	18.00
Copper, light and bottoms	16.00
Brass, heavy	14.00
Brass, light	10.00
Heavy machine composition	18.00
No. 1 yellow rod brass turnings	11.25
No. 1 red brass or composition turnings	16.00
Lead, heavy	7.75
Lead, tea	6.25
Zinc	5.75

Chicago

CHICAGO, May 11.—Although the transportation situation has improved somewhat locally, numerous embargoes impede shipments to other cities. On the whole the market is still quiet. The price of copper remains unchanged, while tin has declined 8c. Lead and spelter have also fallen, in the case of the former metal not because there has been no buying but because of a general feeling that the price was too high. Even before the railroad strike recessions in both metals were expected. In the old metals zinc and pewter have declined. We quote Lake copper 19.50c. for carloads, tin 57c. to 58c., lead 8.62½c., spelter, 8c., and antimony 12c. On old metals we quote copper wires, crucible shapes, 15.50c.; copper clips, 15.25c.; copper bottoms, 14c.; red brass, 15.50c.; yellow brass, 11.25c.; lead pipe, 7c.; zinc, 6c.; pewter, No. 1, 35c.; tinfoil, 40c., and block tin, 50c., all these being buying prices for less than carload lots.

St. Louis

May 10.—The non-ferrous markets have been quiet with a lower tendency in prices. In car lots lead is quoted at 8.70c., and spelter at 7.90c., with the latter rather weak. On less than car lots the quotations are: Lead, 9.10c.; spelter, 9.15c.; tin, 67c.; copper, 20c.; antimony, 12.50c. In the Joplin district ore prices have been weak because of the transportation difficulties at terminals and because of car troubles, with zinc blende at about \$45 per ton, basis 60 per cent; lead, \$110, but weak, basis 80 per cent, and calamine about \$35 per ton, basis 40 per cent. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 9c.; heavy yellow brass, 10.50c.; heavy red brass, 15c.; heavy copper and copper wire, 16c.; light copper, 13c.; pewter, 35c.; tinfoil, 43c.; zinc, 5c.; lead, 6c.; tea lead, 3c.; aluminum, 24c.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh on finished iron and steel products, with revisions effective from Jan. 1, 1920, in carload lots, to points named, per 100 lb., are as follows:

New York, 27c.; Philadelphia, 25c.; Boston, 29½c.; Buffalo, 21c.; Cleveland, 17c.; Cincinnati, 23½c.; Indianapolis, 24½c.; Chicago, 27c.; St. Louis, 34c.; Kansas City, 59c.; St. Paul, 49½c.; all in carloads, minimum 36,000 lb. To Denver the rate is 99c., minimum carload 40,000 lb.; Omaha, 59c., minimum carload 36,000 lb.; New Orleans, 38½c., minimum carload 36,000 lb.; Birmingham, 57½c., minimum carload 36,000 lb. To the Pacific Coast the rate is \$1.25 per 100 lb. on articles of iron and steel, minimum carloads 80,000 lb., while the structural steel rate is \$1.25, minimum carload 50,000 lb., or \$1.315, minimum carload 40,000 lb. The rate on ship plates, Pittsburgh to Pacific Coast, is \$1 per 100 lb., minimum carload 80,000 lb. On wrought iron and steel pipe, the rate from Pittsburgh to Kansas City is 56c., to St. Paul 49½c., to Denver 99c., to Omaha 56c., all in carload lots, minimum 46,000 lb. To Jacksonville, Fla., all rail carloads, 41½c., minimum 36,000 lb., less than carloads, 59c.; rail and water, carloads 34½c., minimum 36,000 lb.; less than carloads 46½c. On iron and steel items not noted above, the rates vary somewhat, and are given in detail in the regular railroad tariffs.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in., on one or both legs, ¼ in. thick and over, and zees, structural size, 2.45c. to 4c.

Wire Products

Wire nails, \$3.25 to \$4 base per keg; galvanized, 1 in. and longer, including large-head barbed roofing nails, taking an advance over this price of \$1.50 and shorter than 1 in., \$2. Bright basic wire, \$3 to \$3.50 per 100 lb.; annealed fence wire, Nos. 6 to 9, \$3 to \$3.50; galvanized wire, \$3.70 to \$3.95; galvanized barbed wire and fence staples, \$4.10 to \$4.45; painted barbed wire, \$3.40 to \$3.75; polished fence staples, \$3.40 to \$4.50; cement-coated nails, per count keg, \$2.85 to \$3.75; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 60 per cent off list for carload lots, 59 per cent for 1000-rod lots, and 58 per cent for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large structural and ship rivets, \$4.50 base
Large boiler rivets, 4.60 base
Small rivets, .50 per cent off list
Small machine bolts, rolled threads,

40, 10 and 5 per cent off list
Same sizes in cut threads, .40 and 5 per cent off list
Longer and larger sizes of machine bolts, 30 and 10 per cent off list

Carriage bolts, ¾ in. x 6 in.:
Smaller and shorter, rolled threads, 40 and 5 per cent off list
Cut threads, .30 and 10 per cent off list
Longer and larger sizes, .30 per cent off list

Lag bolts, .50 per cent off list
Plow bolts, Nos. 1, 2 and 3 head, .40 per cent off list
Other style heads, .20 per cent extra

Machine bolts, c.n.c. and t. nuts ¾ in. x 4 in.:
Smaller and shorter, .35 per cent off list
Longer and larger sizes, .25 per cent off list

Hot pressed and cold pressed sq. or hex. blank nuts, 2c. off list
Tapped nuts, \$1.75 off list
Semi-finished hex. nuts, U. S. S. and S. A. E.:

¾-in. and larger, .60 and 5 per cent off list
¾-in. and smaller, .70 and 5 per cent off list
¾-in. and smaller A. L. A. M. or S. A. E.:

70, 10 and 5 per cent off list
Stove bolts in packages, .70 and 10 per cent off list
Stove bolts in bulk, .70, 10 and 2½ per cent off list

Tire bolts, .55 and 10 per cent off list
Track bolts, .6c. base
One cent per lb. extra for less than 200 kegs. Rivets in 100-lb. kegs 25c. extra.

All prices carry standard extras f.o.b. Pittsburgh.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, \$52 to \$70; chain rods, \$75 to \$80; screw rivet and bolt rods and other rods of that character, \$65 to \$70. Prices on high carbon rods are irregular. They range from \$75 to \$100, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes, ¾ to 9/16 in. and larger, \$4 per 100 lb. in lots of 200 kegs of 200 lb. each or more; spikes, ¾-in. and 7/16-in., \$4.25; 5/16-in., \$5; track bolts, \$4.90 to \$5. Boat and barge spikes, \$4.50 per 100 lb. in carload lots of 200 kegs or more, f.o.b. Pittsburgh. Tie plates, \$3 to \$4 per 100 lb.

Terne Plates

Prices of terne plates are as follows: 8-lb. coating, 200 lb., \$13.80 per package; 8-lb. coating, I. C., \$14.10; 12-lb. coating, I. C., \$15.80; 15-lb. coating, I. C., \$16.80; 20-lb. coating, I. C., \$18.05; 25-lb. coating, I. C., \$19.30; 30-lb. coating, I. C., \$20.30; 35-lb. coating, I. C., \$21.30; 40-lb. coating, I. C., \$22.30 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.35c. to 4c. from mill. Common bar iron, 4.50c.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card, discounts on steel pipe applying as from Jan. 14, 1920, and on iron pipe from Jan. 7, 1920:

Steel		Iron	
Inches	Black Galv.	Inches	Black Galv.
¼, ½ and ¾	47	¼ and ½	1 + 25
¾	51	¾	25½ + 1½
¾ to 3	54	1½	29½ 11½
		¾ to 1½	34½ 18½
		2 and 2½	33½ 17½
Lap Weld		Lap Weld	
2	47	1½	24½ 9½
2½ to 6	50	1½	31½ 17½
7 to 12	47	2	28½ 14½
13 and 14	37½	2½ to 6	30½ 17½
15	35	7 to 12	27½ 14½
Butt Weld, extra strong, plain ends		Butt Weld, extra strong, plain ends	
¼, ½ and ¾	43	¼	+7 +40
¾	48	¾	23½ 6½
¾ to 1½	52	¾	28½ 15½
2 to 3	53	¾ to 1½	34½ 19½
		2 and 2½	34½ 19½
Lap Weld, extra strong, plain ends		Lap Weld, extra strong, plain ends	
2	45	1½	27½ 13½
2½ to 4	48	2	29½ 16½
4½ to 6	47	2½ to 4	31½ 19½
7 to 8	43	4½ to 6	30½ 18½
9 to 12	38	7 to 8	22½ 10½
1½	21½	9 to 12	17½ 8½

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers have been seven (7) points lower (higher price) than carload lots and on butt and lap weld galvanized iron pipes have been nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots f.o.b. Pittsburgh:

Lap Welded Steel	Charcoal Iron
3½ to 4½ in.	1½ and 1¾ in. +20
2½ to 3½ in.	2 and 2½ in. +10
2½ in.	2½ and 2¾ in. +1
1¾ to 2 in.	3 and 3¼ in. — 1½
	3½, 4 and 4½ in. — 8

Standard Commercial Seamless—Cold Drawn or Hot Rolled

Per Net Ton	Per Net Ton
1 in. \$327	1½ in. \$207
1½ in. 267	2 to 2½ in. 177
1¾ in. 257	2½ to 3½ in. 167
1½ in. 207	4 in. 187
	4½ to 5 in. 207

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiations.

Sheets

Prices of the Steel Corporation for mill shipments on sheets of United States standard gage in carloads and larger lots for indefinite delivery are given in the left-hand column. For reasonably prompt delivery, mills have no trouble in getting prices quoted in the right-hand column, or even higher prices.

Blue Annealed—Bessemer

	Cents per lb.
No. 8 and heavier	3.50 to 5.95
Nos. 9 and 10 (base)	3.55 to 6.00
Nos. 11 and 12	3.60 to 6.05
Nos. 13 and 14	3.65 to 6.10
Nos. 15 and 16	3.75 to 6.20

Box Annealed, One Pass Cold Rolled—Bessemer

Nos. 17 to 21	4.15 to 6.30
Nos. 22 to 24	4.20 to 6.35
Nos. 25 and 26	4.25 to 6.40
No. 27	4.30 to 6.45
No. 28 (base)	4.35 to 6.50
No. 29	4.45 to 6.60
No. 30	4.55 to 6.70

Galvanized Black Sheet Gage—Bessemer

Nos. 10 and 11	4.70 to 7.50
Nos. 12 to 14	4.80 to 7.60
Nos. 15 and 16	4.95 to 7.75
Nos. 17 to 21	5.10 to 7.90
Nos. 22 to 24	5.25 to 8.05
Nos. 25 and 26	5.40 to 8.20
No. 27	5.55 to 8.35
No. 28 (base)	5.70 to 8.50
No. 29	5.95 to 8.75
No. 30	6.20 to 9.00

Tin-Mill Black Plate—Bessemer

Nos. 15 and 16	4.15 to 6.15
Nos. 17 to 21	4.20 to 6.20
Nos. 22 to 24	4.25 to 6.25
Nos. 25 to 27	4.30 to 6.30
No. 28 (base)	4.35 to 6.35
No. 29	4.40 to 6.40
No. 30	4.40 to 6.40
Nos. 30½ and 31	4.45 to 6.45

PERSONAL

T. C. Allen, formerly comptroller Tacony Steel Co., has been appointed assistant to the president of the Penn Seaboard Steel Corporation. He was one of the early members of the Tacony organization. He became comptroller of the Tacony Ordnance Corporation on Jan. 1, 1918. Previous to his coming to Tacony he had been for two years assistant comptroller of the Remington Arms Co. of Delaware.

George O. Smalley, general manager and treasurer Bound Brook Oil-less Bearing Co., Bound Brook, N. J., has announced the appointment of George A. Shoemaker as works manager. He was formerly in a similar position with David Lupton Sons Co., Philadelphia.

W. F. Thurmond, Jones & Thurmond, 25 Broad Street, New York, has purchased the interest of John W. Rapp and associates in the Empire Tube & Steel Corporation, College Point, Long Island. Mr. Thurmond and his associates now own the entire capital stock of this company. John W. Rapp and A. J. Connell have resigned from the board of directors.

DeWitt V. D. Reiley, formerly vice-president Davis-Bournonville Co., oxy-acetylene welding and cutting apparatus, Jersey City, N. J., was elected president at a recent meeting of the directors, succeeding Augustine Davis, who resigned last November. Charles B. Wortham, treasurer since the company's organization, was elected vice-president, and William G. McCune, secretary and treasurer. The directors are DeWitt V. D. Reiley, Charles B. Wortham, William G. McCune, Charles J. Mayer, Augustine Davis, Daniel E. Evarts and H. Rowntree.

Edward B. Richardson and Harry Gay have formed the partnership, Richardson & Gay, consulting engineers, 220 Devonshire Street, Boston 9, Mass. Mr. Richardson, formerly of Richardson & Hale, consulting engineers, went overseas with the Twenty-sixth Division and was discharged from the army in 1919 as lieutenant-colonel, field artillery. Mr. Gay has been for the past nine years in the Boston office of Stone & Webster, division of construction and engineering.

Thorsten Y. Olsen of the Tinius Olsen Testing Machine Co., Philadelphia, was scheduled to address the Philadelphia Foundrymen's Association at its 297th meeting held at the Manufacturers' Club Wednesday evening, May 12, on "Recent Development of the Testing Machine and the Testing of Material."

Victor T. Noonan, director of safety Fore River Shipbuilding Corporation, Quincy, Mass., has resigned to become a public consulting engineer, with headquarters in Boston. The work heretofore carried on under Mr. Noonan will be transferred to the service department, E. D. Larkin in charge.

At a recent meeting of the board of directors of the Sheffield Iron Corporation, Walter S. Reed was elected president to succeed the late James Gayley. James R. Floyd is vice-president and treasurer, and John S. Levis secretary and assistant treasurer. The general offices of the company are at 71 Broadway, New York, and the blast furnace plant is at Sheffield, Ala. Mr. Reed began his business life with the Carnegie Steel Co. and was for several years with the United States Steel Corporation, leaving its service several years ago. Since that time he has been associated with Mr. Gayley in the Sheffield Iron Corporation and the American Ore Reclamation Co., of which he is vice-president and treasurer.

The Traylor Engineering & Mfg. Co., Allentown, Pa., announces the appointment of Frank A. Duttonhofer purchasing agent.

J. A. Gibney, Jr., who for the past three years has been district sales manager in New York for the Sizer Forge Co., Erie, Pa., and prior to that with the Niles-Bement-Pond Co. for 13 years, has joined the sales staff of the Betts Machine Co., Rochester, N. Y., and will work out of the New York office.

Charles E. Hildreth, Whitcomb-Blaisdell Machine Tool Co., Worcester, Mass., has recovered from a two months' illness.

M. D. Goodman, who has been with the New York sales office of the Electric Controller & Mfg. Co., Cleveland, for several years, has been appointed manager of the company's new Boston office, which will be opened this week at 49 Federal street, that city.

E. F. Fitch has been appointed director of purchases of the American Radiator Co., vice J. H. Borden, resigned. Justus Egbert has been appointed purchasing agent and F. J. Arnold assistant purchasing agent. The company announces the removal of its general purchasing department from Chicago to 1807 Elmwood avenue, Buffalo, effective May 1.

George A. Lamb, formerly with the American Car & Foundry Co., is now superintendent of the plant of the Sligo Iron & Steel Co., Connellsville, Pa.

E. L. Ramsey, formerly open hearth superintendent American Steel Foundries plant at Alliance, Ohio, has resigned to become superintendent of the open hearth steel plant of the Eastern Steel Co., Pottsville, Pa.

E. E. Fisher, recently manager of Laclede Steel Co.'s branch office, Kansas City, Mo., has severed his connection with that company to embark in business for himself. E. W. Price, assistant general sales manager, is now in charge of the office at 228-9 Scarrit Building.

Frederick A. Sheffler, manager power department, Fuller Engineering Co., New York, recently gave an interesting address on the possibilities of pulverized coal, before the power section, Providence Engineering Society, Providence, R. I.

The Machinery Club of Chicago has elected the following officers for the ensuing year: President, R. R. Cuthbertson, western sales manager Manning, Maxwell & Moore, Inc.; vice-president, J. R. Porter, Marshall & Huschart Machinery Co.; treasurer, H. J. Reeve; secretary, A. G. Bush, Minnesota Mining & Mfg. Co.; assistant secretary, C. J. Becker, Becker Brothers, electrical engineers. The club recently enlarged its quarters in Machinery Hall by about 50 per cent to keep pace with the rapid increase in membership.

R. W. Gallagher will sever his connection with the East Ohio Gas Co., Cleveland, June 1, to become acting president of the Motor Castings Co., Canton. This company, which was taken over some time ago by a company organized by Mr. Gallagher, manufactures motors for trucks and tractors.

James Bryden, works manager Smith & McLean, Ltd., manufacturers of sheets, plates, bars, hoops and strips, Glasgow, Scotland, is in the United States making a visit to some of the steel plants of the country, partly to investigate the use of pulverized coal.

Dr. John Boswell Whitehead, professor of electrical engineering, Johns Hopkins University, Baltimore, has been appointed dean of the department of engineering of the institution. This is a new office and places the engineering department on an equality with the College of Arts and Sciences and the School of Medicine. Dr. Whitehead was graduated from the Hopkins electrical engineering department in 1893 and for three years was in the employ of the Westinghouse Electric Co., Pittsburgh. Later he became connected with the Niagara Falls Power Co., New York. He returned to Hopkins in 1897 and received a degree of bachelor of arts. In 1902 he was made a doctor of philosophy and received a research fellowship in Carnegie Institute of Technology. He later formed a partnership with Charles L. Reeder. In 1914 he was appointed professor of electrical engineering in the new engineering department at Hopkins.

F. A. Calhoun, formerly sales engineer Tate, Jones & Co., Inc., in the New York district, has resigned to become eastern representative in New England and middle Atlantic states for the Standard Fuel Engineering Co., Detroit, for its heat treating furnaces. Headquarters are at 76 Montgomery street, Jersey City, N. J.

Charles F. Lederer, until recently superintendent of way, Milwaukee Electric Railway & Light Co., Milwaukee, Wis., has become associated with the rail welding department, Metal & Thermo Corporation, New York. He entered the track department of the Milwaukee Electric Railway & Light Co. in April, 1908, and was soon promoted to construction gang foreman. In 1904 he was appointed division roadmaster and in 1912 became city roadmaster. In May, 1919, he rose to assistant superintendent, and in September, 1919, became superintendent of way.

Stuart Wilder has been elected president of the Gilbert-Grant Co., manufacturer of cranes and hoisting equipment, Grand Central Terminal, New York. He was formerly chief engineer of the Russell, Burdall & Ward Bolt & Nut Co.

F. W. Yost, formerly engineer for the American Ore Reclamation Co., New York, has resigned to become district manager of the American Sintering Co., with headquarters at Youngstown, Ohio.

Horace Hammond, president Hammond-Burd Co., and vice-president Alabama By-Product Co., both of Birmingham, Ala., has returned from a visit to California and Arizona. Mr. Hammond has resumed the active charge of his company's affairs.

At a recent meeting of the board of directors of the Wellman-Seaver-Morgan Co., Cleveland, John A. Penton, president of the Penton Publishing Co., was elected a director to fill the vacancy on the board caused by the death of Samuel T. Wellman.

Charles Davis, a roller at the sheet mills of the Youngstown Sheet & Tube Co., Youngstown, Ohio, has been appointed assistant superintendent, succeeding Fred Lawrence, who has resigned to become superintendent of the Superior Sheet Metal Co., Canton, Ohio. Mr. Davis has been in the employ of the Sheet & Tube company for ten years.

G. E. McCabe, formerly with the Challenge Machinery Co., later with Kellar Pneumatic Tool Co., Chicago, is now with the Miller Saw Trimmer Co., Pittsburgh, builder of printers' machinery.

John R. Woods has been made resident manager of the new Worcester, Mass., branch of the Standard Supply & Equipment Co., Philadelphia, and has entered upon his new duties. The company recently acquired the business of the Brierly-Lombard Co. of Worcester, dealer in mill supplies, with stores at 663-665 Main street. The line will be increased, notably in its machine tool department. A recent addition consists of the products of the Union Twist Drill Co., Athol, Mass. Mr. Woods goes to Worcester from the Philadelphia office, from which he has covered the eastern Pennsylvania territory. With him from the home office are W. E. Leonberger, who will have charge of purchases, and C. B. Stewart, at the head of the accounting department.

Taylor Allderdice, vice-president in charge of operations National Tube Co., Pittsburgh, has resigned as a member of the Pittsburgh Board of Public Education, a position he has filled for nearly 10 years.

S. G. Hobert has resigned as consulting engineer of the General Fireproofing Co., Youngstown, Ohio, to resume a general engineering practice in Chicago. He joined the Fireproofing company in the summer of 1917 as production manager, following which he became superintendent of the furniture department and subsequently consulting engineer.

Peter Eyeremann, a steel works engineer, Kladno, Bohemia, who sojourned in the United States some years ago, has been appointed technical consultant for the iron and steel industry for the government at Prague, and also manager for the blast furnaces, steel works and rolling mills of the state property in Povungresova and Tisovec in Slovakia.

William H. Kochenderfer, Philadelphia, has been named general manager of the Chambersburg Foundry & Machine Co., Chambersburg, Pa., which will start operations within a short time. He formerly was employed in the Southwark Foundry Co. plant in Phila-

delphia. The latter concern controls the Chambersburg plant.

Edward K. Pfeil is now with the Federal Sales Co., Pittsburgh, dealer in metal specialties and mill and mine supplies.

J. Frank Brown, formerly with Berry Brothers, has become associated with Hilo Varnish Corporation, Brooklyn, N. Y. He will make his headquarters at Pittsburgh and will look after a special class of trade in the industrial field.

Vernet Dutton, sales department the New Departure Mfg. Co., Bristol, Conn., has been made coaster brake production manager. John St. George has been made production supervisor of the company's plant D, Meriden, Conn.

Thomas O'Brien, district manager American Sheet and Tinplate Co. at Elwood, Ind., since 1908, has been promoted to the management of the Farrell works at Sharon, Pa. He is succeeded by John Byus, one of the department heads.

Albert L. Lerion, for many years purchasing agent Wright Wire Co., Worcester, Mass., and afterwards of that company's successor, the Wickwire-Spencer Steel Corporation, has resigned.

R. Poliakov, who was a member of a former Russian technical war commission, and since the war has been engaged in disposing of property owned by that government, and who has been practising engineering in New York, has moved his office from the Flatiron Building to 100 West Forty-first Street, New York. He was assistant professor of mechanical technology of the Technical Institute of Moscow, and has contributed to these pages in such matters as the cutting of metals by high-speed steel.

W. L. Flaherty, purchasing agent Toledo Scale Co., Toledo, Ohio, for the past ten years, has resigned. He expects to take a Western trip for the next three or four months before entering any other business.

J. H. Reed, Jr., has resigned as purchasing agent of the Philadelphia Co., Pittsburgh, and C. W. Lepper, for some time assistant purchasing agent, has been made purchasing agent.

J. C. Williams, vice-president and general manager Weirton Steel Co., Weirton, W. Va., has returned to his duties from a vacation spent in England.

Edward M. Milligan, first assistant city engineer of Youngstown, Ohio, has resigned to join the engineering forces of the International Steel Tube Co.

J. G. Hershey, 2336 Oliver Building, Pittsburgh, has been appointed purchasing agent for the Mississippi Valley Trading & Navigation Co., Equitable Building, St. Louis. This organization is engaged in foreign trade, specializing in serving the industries located in the Mississippi valley on import and export business. Mr. Hershey will make purchases of iron and steel products on orders of his company.

OBITUARY

DANIEL C. NOBLE, president and treasurer Pittsburgh Spring & Steel Co., Pittsburgh, and also vice-president and a trustee Dollar Savings Bank, Pittsburgh, died at his home in East End, Pittsburgh, on Saturday, May 8. He was born in Baldwin, Me., Aug. 5, 1845, and was educated at Agborn Academy, Me. For more than a quarter of a century he was identified with branches of the Pennsylvania Railroad, going to Pittsburgh in 1868. In 1880 he became associated with the A. French Spring Co., Pittsburgh, remaining with it until 1902, when he founded the Pittsburgh Spring & Steel Co. Mr. Noble was a director of the Farmers Deposit National Bank, the Farmers Deposit Savings Bank, the Farmers Deposit Trust Co., the Reliance Life Insurance Co. and the Western Insurance Co. of Pittsburgh.

ELLIS L. WELCH, 71, assistant traffic manager Republic Iron & Steel Co. for many years, died May 4

at his home on the outskirts of Youngstown, following a five months' illness of heart trouble. He entered the traffic department of the Republic company in 1900, retiring in December, 1919, because of failing health. He had previously served as freight agent for the Pennsylvania Railroad at Sharon, Pa., and Youngstown, Ohio.

DANIEL STERN, publisher and proprietor *American Artisan and Hardware Record*, died recently at his home in Chicago, where he was born April 26, 1859. He joined the *Watchmaker and Metalworker* in 1878. Two years later he established the *American Artisan*, which had previously been a house organ for Cragin Brothers & Chandler, known as the *Tinner and House Furnisher*. This became a weekly publication in 1885.

CHRISTIAN MATTISON, founder and president C. Mattison Machine Works, Rockford, Ill., died at the Presbyterian Hospital, Chicago, on April 28, aged 63 years. He maintained his residence in Beloit, Wis., after the removal of the Mattison shops to Rockford. His two sons, Arthur M. and Laurence Mattison, in active charge of the business, reside in Rockford.

GEORGE F. GRIFFIN, formerly vice-president and general manager the Griffin Wheel Co., Chicago, died at Miami, Fla., May 4. Mr. Griffin was a son of Thomas A. Griffin, founder of the Griffin company, and was an officer of the corporation until last July, when the American Steel Foundries took control.

JOHN O. B. DELLET, secretary Penn Steel & Iron Corporation, Lancaster, Pa., died in his home in that city following an attack of apoplexy, at the age of 47. He started with the company more than 25 years ago.

EDGAR A. GILBERT, president and manager Standard Boiler & Plate Co., Niles, Ohio, died April 28, age 49 years. Associated with others, he organized the Niles Boiler Co., in 1897, and in 1906 organized the Standard company of which he was the head until his death.

RONALD CRAWFORD, vice-president and general manager of the Oven Equipment & Mfg. Co., New Haven, Conn., since 1903, died April 16. Mr. Crawford had been ill for a year.

CHARLES KLING, president Kling Brothers Engineering Works, manufacturer of drilling, punching and shearing machines, 1304 Kingsbury street, Chicago, died May 4 in that city at the age of 49.

JOHN PROVEN, superintendent Pittsburgh Steel & Spring Co., Pittsburgh, died suddenly at his home in Bellevue, Pa., on Wednesday, May 5.

American Iron and Steel Institute's May Meeting

The seventeenth general meeting of the American Iron and Steel Institute will be held at the Hotel Commodore on May 28. There will be a morning, afternoon and evening session. The program for the meeting will include the following papers:

- Address by the president.....Elbert H. Gary
Chairman, United States Steel Corporation, New York.
Industry's Need of Oil.....George Otis Smith
Director, United States Geological Survey, Washington.
Welfare Work in the Steel Industry.....Charles L. Close
Manager, Bureau of Safety, Sanitation and Welfare,
United States Steel Corporation, New York.
Fatigue of Metals Under Repeated Stress.....H. F. Moore
Research professor of engineering material, and J. B. Komers,
research associate professor of engineering material,
University of Illinois, Urbana, Ill.
The Future of Oxygen Enrichment of the Air
in Metallurgical Operations.....F. G. Cottrell
Bureau of Mines, Washington.
The Microscope and the Heat Treatment of Steel.
Albert Sauveur
Professor of Metallurgy, Harvard University, Cambridge,
Mass.
A Method of Producing Pipeless Rolled Products from
Annular Blooms.....C. A. Witter
Provident Engineering Co., Philadelphia.
The Acid Open-Hearth Process.....B. deMare
Superintendent open hearth department, Midvale Steel &
Ordnance Co., Philadelphia.
Discussion of each paper under the five-minute rule.

SERIOUS SHORTAGE

Car Situation as Shown by Report of U. S. Geological Survey

WASHINGTON, May 11.—The full effect of the unprecedented car shortage situation upon the coal and coke industry is shown by an analysis of the situation by the Geological Survey. The shortage, due chiefly to the railroad yardmen and switchmen's strike, is by far the most severe in the three years during which the Geological Survey has kept records of coal production. Out of the 48 working hours during the week ended April 24, the coal mines were closed down 22.5 hours because of lack of transportation facilities alone. The strike of railroad employees affected to a greater or less degree the yards at Kansas City, St. Louis, Chicago, Toledo, Cleveland, Cincinnati, Columbus, Youngstown, Pittsburgh, Buffalo, and New York, causing congestion which had the double effect of blocking the rails with trains loaded with coal, and of delaying the return of empties to the mines.

There was a slight improvement in conditions during the week ended May 1 over the preceding week, which in turn showed a slight improvement over the week ended April 17. The total transportation loss during the week ended April 24 was 46.8 per cent, as against 50.5 per cent during the week ended April 17. An improvement was noted in the southern Appalachian, Kanawha, New River, West Virginia Panhandle, Cumberland-Piedmont, and Westmoreland fields; in Section C of central Pennsylvania, and in the central competitive field west of Pittsburgh. There was little change noted in northeastern Kentucky, Virginia, Alabama, and the Kenova-Thacker fields. Other districts east of the Mississippi reported more acute shortage than before.

In spite of the improvement, the car shortage was extraordinarily acute. In only five out of 28 districts east of Mississippi did the loss amount to less than 20 per cent. In 14 it exceeded 50 per cent; in 10 it exceeded 60 per cent, and in one—the Hazard field—it amounted to 84.7 per cent. The car shortage was not confined to the territory east of the Mississippi, but attained serious proportions in Colorado and Utah, reaching in the last-named state 76.8 per cent.

As showing how much more severe the present shortage is than anything during the past three years, it is stated that the most acute car shortage during the winter of 1917-1918 was 35.5 per cent which was recorded in the week of Jan. 12, 1918. The worst car shortage of the past winter occurred in the week of Feb. 21, 1920, and amounted to 38.3 per cent. The losses during the weeks of April 17 and 24, 1920, 50.5 and 46.8 per cent respectively, are probably as serious as have ever occurred in recent years.

There was a slight recovery in the production of beehive coke during the week ended May 1. The total output estimated for the week was 373,000 net tons, as against 342,000 tons in the preceding week. In spite of the 9 per cent increase, production was only three-fourths of that of the last week in March. The acute car shortage situation was the cause of the slump in production.

The cumulative production of coke since the beginning of the calendar year now amounts to 7,388,000 tons, or within 15,000 tons of that of the corresponding period of 1919.

There was an increase of 413,000 tons in the production of bituminous coal in the week ended May 1 over the previous week. The total output, including lignite and coal coked at the mines is estimated at 8,898,000 net tons. This was an increase of 413,000 tons over the preceding week, but was 2,117,000 tons less than that of the last week in March.

The year 1920, although 33,500,000 tons ahead of 1919, is nearly 7,000,000 tons behind 1917, and about 9,000,000 behind 1918.

The Canadian Steel Foundries, Welland, Ont., which has been closed down for over a year, will be opened in about six weeks.

Machinery Markets and News of the Works

BUSINESS FALLS OFF

Railroad Situation Generally Blamed for Decline in Orders

Some Large Projects Are Going Ahead, However, Despite Uncertain Conditions

While some improvement in railroad transportation of machine tools has been noted in the past week, the situation is still very troublesome, and under the conditions prevailing it is not surprising that both inquiries and orders for machine tools have dropped off decidedly. In some of the markets it has been exceptionally dull in the past week. In New England, it is reported, the past week was one of the quietest of the year. At Cleveland there was also a decided slump, and the dullness also extended to the New York and Chicago markets. Cincinnati machine-tool builders report a fair volume of business, notwithstanding the

New York

NEW YORK, May 11.

There has been a decided falling off in machine-tool business in the past week. Inquiries as well as orders were considerably below the average of preceding weeks. Machine-tool sellers ascribe this situation to the demoralization due to the railroad tie-up and to a feeling of hesitancy, which is again apparent among buyers. Business has been gradually tapering off in the past two months. With some companies the peak of orders for the past year was reached in February; with others it was reached in December or January. A large lathe manufacturer sold twice as many lathes in December as it sold in April, and the April sales record was about on a par with last August, when the present buying movement got into full swing. One machine-tool manufacturer has sold as many machines in its eastern territory in the four months of 1920 as were sold in all of 1919.

Some believe that the present lack of buying is but a temporary condition, as a great deal of business is known to be under consideration, including some fairly heavy railroad buying. A better feeling is in evidence also because of improvement in railroad transportation. Some plants have shipped tools in the past week for the first time in weeks. However, it will probably be several weeks before conditions approach normal.

The General Electric Co. is again in the market for tools, having inquiries out for 15 milling machines, eight shapers, several grinders and other machines for its new Bridgeport, Conn., plant. Some of the tools bought for the Bridgeport plant several weeks ago were diverted to the recently acquired Baltimore plant. The Simms Magneto Co., East Orange, N. J., has bought more tools, its purchases in the past few weeks having been fairly heavy. The Van Sicklen Speedometer Co., Newark, N. J., has canceled orders for tools purchased for the manufacture of magnetos, it having been decided to confine production, for the present, at least, to speedometers.

Export trade is not particularly active, but some orders are being placed. England is showing a preference for American tools, particularly for automobile production. A newspaper dispatch from Berlin to the Associated Press states that a leading member of a German committee to foster trade relations between Great Britain and Germany, writes from London that England offers slight encouragement to the German machine-tool manufacturer. He says that the market is flooded with American tools, bought during and since the war. "These American tools," he writes, "are of excellent quality and made to the English foot and inch measure. For that reason they are preferred. Moreover, English workmen still have a strong objection to tools of German make."

Crane sales continue light with a fair number of inquiries

fact that a number of shops are wholly or partially affected by the machinists' strike in that district.

Some large projects are going ahead despite the general lack of small orders. Henry Ford & Son placed an order in Cleveland for 40 drilling machines for their tractor plant at Dearborn, Mich. The General Electric Co. is again in the market for some 30 or 40 tools for its recently acquired plant at Bridgeport, Conn. The Simms Magneto Co., East Orange, N. J., has been a fairly large buyer. The Toledo Machine & Tool Co., Toledo, Ohio, has put out inquiries for a round lot of tools.

Price advances continue. A maker of turret lathes has advanced 15 per cent and another has raised its prices 12½ per cent. Some makes of shapers have gone up about 12 per cent. Deliveries are no better, and in most instances much worse than before the railroad tie-up. One large Eastern dealer has \$3,000,000 worth of orders on his books, and on a goodly portion of this business deliveries are past due.

ries in the market for cranes of small capacity. Inquiry for a 10-ton overhead traveling crane will probably be issued soon by the Lord Construction Co., 105 West Fortieth Street, New York, which recently made a machine tool purchase. The Federal Shipbuilding Co., Kearny, N. J., is in the market for a 5-ton overhead traveling crane and the inquiry of the American Metal Co., 61 Broadway, New York, issued last fall will be reissued. It called for two 10-ton and one 5-ton overhead traveling cranes. The Savannah River Lumber Co., Savannah, Ga., is in the market for a 10-ton locomotive crane.

Recent sales include: The Champion Engineering Co., a 15-ton, 29-ft. 6-in. span overhead traveling crane to the Phoenix Utilities Co., 61 Broadway, New York; the Pawling & Harnischfeger Co., a 30-ton, 42-ft. span overhead traveling crane, to Sanderson & Porter, New York, for the Columbus, Delaware & Maryland Electric Co.; the Bedford Foundry & Machine Co., a 7½-ton, 86-ft. span, overhead traveling crane with magnet to the Bossert Corporation, Utica, N. Y.; the Ohio Locomotive Crane Co., a 15-ton, 45-ft. boom locomotive crane with magnet to the Southern Pacific Co. for shipment to Texas; the Shepard Electric Crane & Hoist Co., a 5-ton, 32-ft. span overhead traveling crane to the Monroe Binder Board Co., Monroe, Va., two 2-ton single I-beam cranes to the Fox Furnace Co., Elyria, Ohio, and six 3-ton electric hoists to the Heddon Iron & Construction Co., West Elizabeth, N. J. The Atlas-Crucible Steel Co., Dunkirk, N. Y., has purchased the 25-ton and three 15-ton overhead traveling cranes for which it was recently in the market and the Cambria Steel Co. has purchased two 50-ton overhead traveling cranes. The Pittsburgh Rolls Corporation, Pittsburgh, has purchased two 30-ton, 60-ft. span overhead traveling cranes for a new foundry from the Pittsburgh Crane & Equipment Co., Sharpsburg, Pa.

Andersen, Meyer & Co., 80 Wall Street, New York, have issued an inquiry for 30 miscellaneous tools for shipment to Shanghai, China.

E. D. & A. F. Cronk, Utica, N. Y., will soon start the manufacture of a three-speed transmission for Ford cars. Machine-tool equipment has been bought.

The Gem Auto Truck Co., Troy, N. Y., which is manufacturing a light four-cylinder motor truck, will expand its facilities. A few new tools have been purchased.

The Twin-Energy Motor Corporation, Troy, N. Y., is engaged in experimental work on a twin-energy motor. Equipment for production probably will be bought as soon as the corporation has completed its organization.

The Brunner Mfg. Co., Utica, N. Y., is tripling the size of its plant for the manufacture of automobile air pumps.

The Utica Compressor Co., Utica, N. Y., H. B. Hemstraw, president, has taken over a plant at 712 Washington Street, that city, and will engage in the production of automobile air pumps, with an initial production of 20 a day.

The Savage Arms Corporation, Utica, N. Y., has begun the production of rear axles and will be in the market shortly for more machine-tool equipment.

The Weekes-Hoffman Co., Syracuse, N. Y., has recently received a contract for 150,000 sets of gears, and is considering the purchase of additional machine-tool equipment.

The McDermott Body Corporation, 123 Sixth Street, Long Island City, manufacturer of automobile bodies, has acquired about 20,000 sq. ft. at Van Alst Avenue and Thirtieth Street for a new two-story plant.

The American Machine & Foundry Co., Second Avenue and Fifty-sixth Street, Brooklyn, has commenced the erection of an addition to its works at Second Avenue and Fifty-fifth Street, to cost about \$30,000.

The A. B. Murray Co., New York, has been incorporated with a capital stock of \$200,000 by A. B. and A. Murray and W. F. Keenan, 360 Sixth Avenue, Brooklyn, to manufacture iron and steel products.

The P. Trainor Co., 110 Greene Street, Brooklyn, operating a boiler works and metal plant, is arranging for the erection of a five-story plant at Hill and Gale streets, Jamaica, L. I., for the manufacture of motor car parts, etc.

The Elvin Mechanical Stoker Co., 30 Church Street, New York, a Delaware corporation, has increased its capital stock from \$500,000 to \$1,500,000.

The Eloc Process Co., Yonkers, N. Y., has been incorporated with a capital stock of \$35,000 by W. H. Cole, W. Belknap and P. Loff, 203 West Fortieth Street, New York, to manufacture metal products.

The E. G. Long Co., 50 Church Street, New York, manufacturer of electric railroad materials, has increased its capital stock from \$100,000 to \$250,000.

The International Garage Co., 252 West Fortieth Street, New York, has arranged for the occupancy of a five-story building, 72 x 102 ft., at 213-17 West Eighty-fourth Street, for a service and repair works. Improvements will be made in the structure to cost about \$25,000.

The Dalyte Lamp Co., New York, has been incorporated with a capital stock of \$50,000 by P. J. Mee, K. Kiely and W. B. Boinset, 413 Greenwich Street, to manufacture electric lamps, fixtures, etc.

The Willoughby Co., Dwyer Avenue and Turner Street, Utica, N. Y., manufacturer of automobile bodies, is having plans prepared for a four-story addition, 75 x 150 ft., to cost about \$50,000.

The Washington Slate Products Co., Granville, N. Y., recently incorporated, will operate a machine shop and foundry in connection with its quarrying plant. E. B. Hallett and A. P. Anderson, 34 Nassau Street, New York, head the company.

A two-story power plant, 50 x 135 ft., to cost about \$135,000, including equipment, will be erected at 26-28 West Thirtieth Street by James A. Hearn's Sons, Inc., 20 West Fourteenth Street, New York.

The Radio Corporation of America, Woolworth Building, New York, is planning for the erection of a radio station, comprising a five-unit plant for long-distance communication, on a site to be purchased in the vicinity of New York. Edward J. Nally is president.

The Automatic Straight Air Brake Co., 14 Wall Street, New York, has leased a portion of the building at Twenty-fifth Street and Eleventh Avenue for the establishment of a new works. It is operating a testing plant at 183 Greenwich Street.

The Prometheus Electric Co., 511 West Forty-second Street, New York, manufacturer of electrical specialties, has increased its capital stock from \$500,000 to \$850,000.

The Hotchkiss Garage & Repair Co., New York, has leased the four-story building at the Southern Boulevard and 163d Street for the establishment of a service and repair works.

The Otis Elevator Co., Eleventh Avenue and Twenty-sixth Street, New York, is having plans prepared for an addition to its foundry and forge shop at Yonkers, N. Y. Improvements will be made also in the existing buildings.

The Durbrow & Hearne Mfg. Co., 12 Wooster Street, New York, manufacturer of coil hardening equipment, etc., has filed notice of dissolution.

The Standard Steel Car Co., 1920 Broadway, New York, automobile department, has filed plans for a five-story service and repair works, 137 x 187 ft., on South Jane Street, near Ely Avenue, Long Island City, to cost about \$30,000.

The Horizontal Hydraulic Hoist Co., Milwaukee, Wis., has acquired about 10,000 sq. ft. at Harris and Van Alst avenues, Long Island City, as a site for a branch establishment.

The White Motor Co., Park Avenue and Fifty-seventh Street, New York, manufacturer of automobiles, with plant

at Cleveland, Ohio, is arranging for an increase in its capital stock from \$25,000,000 to \$35,000,000.

W. R. Smith & Co., New York, operating a machine shop at 306 West Fifty-second Street, have leased an adjoining building at 304 West Fifty-second Street for extensions.

The Erie Railroad Co., 50 Church Street, New York, has removed its equipment and shops from Port Jervis, N. Y., to Dunmore, Pa., and will operate hereafter at this location, giving employment to about 200. It is also planning for the removal of its Wyoming division works to the same location. This action is being taken as a result of the recent railroad strike and the traffic tie-up caused in this district.

The Stutz Motor Car Co., 37 Wall Street, New York, has filed a notice of increase in active capital stock from \$600,000 to \$1,000,000. Its plant is at Indianapolis, Ind.

The Albion Wood & Metal Products Co., Albion, N. Y., has been incorporated with a capital stock of \$35,000 by J. P. Rupp, H. C. Cuolette and A. Meland to manufacture metal specialties, machine parts and other products.

The Auto Metal Products Co., 432 East Seventy-first Street, New York, is arranging for the installation of engine lathe, drill presses and other machine tools.

The Perth Amboy Dry Dock Co., foot of Broad Street, Perth Amboy, N. J., has awarded contract to Griffen & Thompson, 223 Jefferson Street, for the erection of a new machine shop.

The Vacuum Oil Co., Constable Hook, Bayonne, N. J., has filed plans for a new can manufacturing plant at its refining works to cost about \$86,000.

The Continental Can Co., 616 West Forty-third Street, New York, has filed plans for a five-story, reinforced-concrete plant at Jersey City, N. J., to cost about \$700,000, including equipment. It will be 200 x 200 ft. and will occupy the block on Monmouth Street from Fifteenth to Sixteenth streets. Employment will be given to about 2000. It is proposed to push construction and have the structure ready for occupancy at an early date.

The Boat Repair Corporation, Communipaw Avenue, Jersey City, N. J., has filed plans for two two-story shop and operating additions, to cost about \$26,000.

The Hope Foundry & Machine Co., East Orange, N. J., has been incorporated with a capital stock of \$125,000 by Gordon Grand, H. H. Picking and F. E. Lynch, to manufacture iron and steel castings, machinery, etc.

The A. B. See Electric Elevator Co., Pacific Avenue, Jersey City, N. J., manufacturer of passenger elevators, has awarded a contract to W. F. & F. W. Cane, 233 Broadway, New York, for a one-story, brick and reinforced-concrete addition, 33 x 85 ft., to cost about \$16,000. It will be used as a forge and blacksmithing shop.

The Wood Newspaper Machine Co., 688 South Second Street, Plainfield, N. J., manufacturer of printing presses, will build a one-story addition, 40 x 108 ft., to cost about \$21,000.

The Simms Magneto Co., North Arlington Avenue, East Orange, N. J., manufacturer of magnetos and ignition systems, has filed plans for a two-story, reinforced-concrete addition to cost about \$250,000.

The F. & H. Foundry Co., Berkeley Avenue, Newark, N. J., manufacturer of bronze and brass castings, etc., is considering plans for works near the Heller aviation field, Forest Hill section. The company was formerly known as the Franz-Holbrook Bronze Co.

The Jersey Cord Tire Corporation, 118 Adams Street, Newark, N. J., has been incorporated with a capital stock of \$1,000,000 by Clement C. Eckrode, Newark; John G. Hultin, Elizabeth; and William D. Reynolds, Cranford, N. J., to manufacture automobile tires.

A new one-story power plant, 50 x 73 ft., to cost about \$20,000, will be erected by the American Hair Felt Co., Newark, at 139 Lockwood Street.

Phineas Jones & Co., 305 Market Street, Newark, manufacturer of automobile wheels, bodies, etc., has acquired about 15 acres at Hillside for a new plant. The works will consist of a number of buildings, with main unit 40 x 300 ft., for assembling and general production; other structures will be 120 x 124 ft., with L-extension, 35 x 50 ft.; band shop, 50 x 120 ft.; power plant, 30 x 60 ft.; and a series of 24 kilns, each 19 x 27 ft. The plant is estimated to cost about \$300,000. The company recently increased its capital stock from \$100,000 to \$500,000. William E. Lehman, 738 Broad Street, is architect.

Edward Verstraeti & Sons, 10 Railroad Place, Newark, have filed notice of organization to manufacture electrical and mechanical devices. Edmond and Theodore J. Verstraeti, 615 Washington Avenue, Belleville, head the company.

The Gamon Meter Co., 282 South Street, Newark, manufacturer of water meters, has filed plans for a two-story addition.

The Belmont Body Builders Corporation, Belmont Avenue, Newark, manufacturer of automobile bodies, has completed plans for a one-story plant to cost about \$16,000.

The John H. Nelles Co., 835 Springfield Avenue, Irvington, N. J., has been incorporated with a capital stock of \$50,000 by John H. Nelles and Percy L. Gallagher, to manufacture heating and ventilating equipment.

Considerable precision machinery, electrically operated, will be installed in the new jewelry manufacturing works to be erected by Kohn & Co., Camp and Orchard streets, Newark, on property recently acquired at 308-12 Mulberry Street. The plant will specialize in gold and platinum work and will be three stories, L-shape, providing a total of about 12,000 sq. ft. It is planned to inaugurate construction June 1.

The A. & R. Lamp Co., Newark, has been incorporated with a capital of \$125,000 by Arthur J. and William J. Rainaud, to manufacture lighting fixtures and devices.

The Bracher Co., Inc., Belleville, N. J., manufacturer of scythe stones, oil stones, razor hones, grinding wheels and abrasive specialties, is building a new plant which will be completed the latter part of this year.

Daniel A. Daly, 896 Eighth Avenue, New York, has organized the Daly Steel Products Corporation and is building a factory at 90-96 Tenth Street, Long Island City, to make steel riser and stair sections. It is expected that manufacturing will begin July 1.

New England

BOSTON, May 10.

Machine tool dealers report a further contraction in business, total sales for the past week being smaller than for any previous corresponding period this year. Indications are, however, that the market will become more active soon as some corporations, which apparently abandoned their 1920 lists, are showing signs of interest again. The Amoskeag Mfg. Co., Boston, is making inquiries on horizontal millers and other equipment contained in its original 1920 list, while the Deane Pump Works, Holyoke, Mass., Worthington Pump & Machinery Corporation, believed to have abandoned its 1920 list, has purchased some small tools and is inquiring for larger machines. The Greenfield Tap & Die Corporation, Greenfield, Mass., is requesting specifications and prices on tools in its list. This company is interested in Government-owned tools as well as new ones. It is intimated the United Shoe Machinery Co., Beverly, Mass., may take some action on its 1920 list within the next few weeks. A representative of a Western railroad has been sounding the Boston market on a long list of tools, including a number of lathes and boring machines, and there are two or three other good-sized orders in the making.

The General Electric Co., Lynn, Mass., continues to buy but on a comparatively limited scale. It is the opinion that labor troubles will further curtail its purchases. Orders from New Bedford, Fall River and some parts of Rhode Island have been scarce, due, it is believed, to labor troubles. The Pneumatic Scale Corporation, Norfolk Downs, Mass., has bought single tools and is negotiating for a 4-in. spline miller. Its new construction work is progressing rapidly. The Rolls-Royce Co. of America, Springfield, Mass., has been buying machine parts, but no new tools. The placing of its plant on a productive basis has been considerably retarded for various reasons, and while additional equipment will be needed, just how much is not known at present. Stevens-Duryea, Inc., Chicopee, Mass., is in the market more or less, but has no list out. The Sinclair Motors, Springfield, Mass., have bought additional small tools, the Metal Saw & Machine Co., Inc., that city, which is the old Napier Saw Works, Inc., recently bought a lathe, and it is reported the Westinghouse Electric & Mfg. Co., East Springfield, will be in the market for considerable equipment before long. Its new punch shop is complete and ready for machinery. The company is contemplating the erection of a shop, 100 x 900 ft., for the manufacture of small motors. Some equipment in the tool room will be moved to the new shop and new equipment for both shops will be bought. Gray & Davis, Inc., Cambridge, Mass., recently bought a small amount of equipment.

The Eco Mfg. Co., South Boston, will move to East Cambridge as soon as its new plant is completed. The company makes piston rings and proposes to produce pistons on a large scale for some of the leading automobile concerns. B. F. Perkins & Son, Holyoke, Mass., is in the market for a 40-ton, 48-ft. span crane. The American Wringer Co., Woonsocket, R. I., is now out of the market.

Local dealers have been notified of a 12 per cent advance in the price of shapers and 10 per cent in some makes of standard drills, speed drills and speed lathes. Deliveries

are slower than ever. Practically all Cincinnati makers, owing to labor troubles, have extended deliveries a month.

Many Connecticut machine tool builders are badly handicapped by their inability to get permission to ship via the New York, New Haven & Hartford Railroad. Some New Haven builders are trucking machines to Springfield, Mass., where connection is had with the Boston & Albany for points in New York and further West, and also to New York City, where the tools are accepted by the railroads. Worcester shipping conditions have been improved by the lifting of an embargo on Englewood, Ill., which opens a direct route to the West via the Boston & Albany and New York Central lines. Shipments of tools via the Central Vermont Railroad can be made from New London and points further North to the West, but freight rates in such cases are very heavy.

The Fore River Shipbuilding Corporation, Quincy, Mass., has installed in its foundry a mold pattern machine capable of handling 14-ton flasks, built by the Herman Pneumatic Machine Co., Zellenople, Pa. The machine primarily is intended for propeller blade molding patterns. A Berwick five-panel type electric rivet heater, operated on 220 volts, 60 cycle, alternating current, has been installed in its steel mill.

Work on the five-story, 40 x 150 ft. addition to the William Schollhorn Co. plant, manufacturer of Bernard pliers, which will increase its output at least 50 per cent and provide nearly 95,000 sq. ft. of floor space, has been held up since December, owing to a lack of carpenters. The company has a large amount of export business on its books which it is unable to fill owing to domestic demands.

The O. S. Walker Co., Worcester, Mass., magnetic chucks and grinding machines, is making improvements and additions to its equipment to speed up deliveries and reduce operating costs. A Norton, 15 x 15 x 8 ft., surface grinder, has just been set up as well as a 26-in. Blanchard grinder, a large Acme lathe, a four spindle Avery drill and other equipment, and other machines will be installed as soon as they arrive. The assembling department, which is cramped for space, is to be enlarged, and other improvements, including a sprinkler system, are in process of contemplation. The company is sold ahead six weeks, but has orders on its books for fall deliveries. Howard E. Tracy, formerly connected with the Norton Co., Worcester, United Shoe Machinery Co., Beverly, Mass., Baxter D. Whitney Co., Windenon, Mass., and the Heald Machine Co., Worcester, in mechanical engineering departments, is mechanical engineer for the O. S. Walker Co. The company employs 45 machinists, but expects to shortly increase the number to 60.

Plans are being drawn for an addition to the plant of the Auto Body Co., Portsmouth, N. H.

Plans are being drawn for a one-story, 60 x 150 ft. brass foundry for the Fritzell Brass Works, Thorn Street, New Haven, Conn.

Contract has been let for a one-story, 24 x 72 ft. addition for the Metal Specialty Co., Waterbury, Conn., on Aurora Street.

The Mount Carmel Brass Co., Hamden, Conn., plans to erect a 125-ft. addition in the near future. It has six months' business on its books.

Work is about to start on three small additions, each one-story, to the Baush Machine Tool Co., Springfield, Mass., plant.

The New York, New Haven & Hartford Railroad, New Haven, will build a one-story, 23 x 75 ft. workshop and engine house on Union Avenue.

Contractors are figuring on a one-and-a-half-story, 60 x 90 ft. plant for the Eastern Auto Body Co., Bridgeport, Conn., which calls for a traveling crane.

Morton H. and W. Herbert Nichols have purchased from the Greenfield Electric Light & Power Co. a brick building in Mill Street, Pittsfield, Mass., in which they intend to manufacture cutlery.

The plant of the Miller Metal Works Co., Southington, Conn., has been purchased by Samuel Munch and his son, Benjamin S. Munch, who intend to make improvements and increase the working force. Tubular parts for automobile, marine and aeroplane engines and tractors will be manufactured.

Contract has been let for a one-story and basement, 32 x 50 ft. foundry addition by the Hampden Brass Co., Liberty Street, Springfield, Mass.

The Worcester Lawn Mower Co., Worcester, Mass., has bought 22,603 ft. adjoining its property on Fremont Street, on which it will build a new plant.

The Wilcox, Crittenden Co., Middletown, Conn., marine hardware, has bought 25 acres in Portland, Conn., having a river frontage of 1000 ft., on which a concrete foundry will be erected.

O. F. Mossberg & Sons, New Haven, Conn., firearms, are booked many months ahead on domestic and foreign orders, but contrary to rumor, are not contemplating expansion at present. It is placing on the market a four-shot .22 cal. semi-automatic safety pocket pistol, having a total length of 4½ in. and weighing 10 oz., called the "Brownie."

The Howe Scale Co., Rutland, Vt., has increased its capital stock from \$2,000,000 to \$3,000,000.

The Abrasive Machine Tool Co., Dexter Road, East Providence, R. I., has completed plans for a one-story addition, 50 x 110 ft., to cost about \$30,000.

Plans have been prepared for a reinforced concrete power plant, 35 x 35 ft., with turbine department, 52 x 54 ft., at the Weybosset Mills of the American Woolen Co., Providence, R. I.

The Hawthorne Co., Bridgeport, Conn., manufacturer of automobile and motorcycle lamps, is planning for the sale of its "Old Sol" works near the city, comprising a reinforced concrete building totaling about 54,000 sq. ft., with 5½ acres of land. The equipment at the plant will also be placed on the market.

The W. A. Ives Mfg. Co., Wallingford, Conn., manufacturer of screw drivers and kindred tools, has increased its capital stock from \$100,000 to \$200,000.

The Hampden Brass Co., Liberty Street, Springfield, Mass., has awarded a contract to L. S. Wood, 14 Stockbridge Street, for a one-story and basement foundry addition, 32 x 50 ft.

The Thomas Laughlin Co., 133 Fore Street, Portland, Me., manufacturer of marine hardware specialties, has awarded a contract to J. W. Gulliver, 120 Exchange Street, for a five-story machine shop, 100 x 100 ft., on Hancock Street, to cost about \$75,000.

The Narragansett Electric Lighting Co., Providence, R. I., has acquired about 10 acres near Melrose Park, for extensions in its mechanical departments. Plans will be prepared for a building for service, construction and repair of electric meters, arc lamps, transformers, etc., with department for underground cable work and general wiring. A pole yard will also be established. Edwin A. Barrows is president.

C. N. Flagg & Co., Inc., 27 State Street, Meriden, Conn., manufacturer of steam heating apparatus, has increased its capital stock from \$25,000 to \$125,000. It will build a one- and two-story plant on Griswold Street, 40 x 120 ft., to cost about \$35,000.

The Kelly Tire & Rubber Co., New Haven, Conn., manufacturer of automobile tires, a Delaware corporation, has increased its capital stock from \$1,000,000 to \$5,000,000.

The Emerson Appliance Co., 251 Causeway Street, Boston, has awarded a contract to Mitchell & Sutherland, 163 Devonshire Street, for a one-story plant at Melrose, Mass., to cost about \$35,000.

The Edgewood Body Works, 34 Edgewood Avenue, Bridgeport, Conn., has been organized to manufacture automobile bodies. David M. Dittler heads the company.

Philadelphia

PHILADELPHIA, May 10.

The Ace Motor Corporation, Philadelphia, manufacturer of motorcycles and bicycles, has taken possession of the former plant of the Savage Arms Co., Erie Avenue and Sepviva Street. It is proposed to equip the works at once. Max M. Sladkin, head of the Haverford Cycle Co., 503 Market Street, is president of the company. The latter organization has filed notice of dissolution under New York State laws.

Fayette R. Plumb, Inc., Tricker and James streets, Philadelphia, manufacturer of tools, has awarded a contract to the William Steele & Sons Co., 46 North Sixteenth Street, for a one-story addition, 20 x 140 ft., to cost about \$20,000.

The Crane Co., 245 Master Street, Philadelphia, manufacturer of steam specialties, valves, pipe, etc., with headquarters at Chicago, is taking bids for a one-story brick building, 60 x 200 ft., at Master Street and Germantown Avenue, to be used as a pipe and pipe bending shop.

The Mitchell Specialty Co., Eighteenth and Market streets, Philadelphia, manufacturer of automobile hardware, etc., has leased space in the building at 3631-39 North Smedley Street for a new works. The area totals about 7000 sq. ft.

The Quaker City Motor Parts Co., Tioga and Richmond streets, Philadelphia, has acquired the three-story building at 2512 North Broad Street, 25 x 177 ft., for an extension.

The Precision Grinding Wheel Co., Philadelphia, has acquired 7½ acres at Torresdale Avenue and Wingate Street, Holmesburg, for its proposed new plant. Construction of the initial building, 90 x 265 ft., has been inaugurated, to cost about \$100,000. The entire plant will comprise a total of eight units, each approximately of the size noted, and is estimated to cost about \$500,000. A. S. Vane is president, and H. A. Plusch, plant manager and ceramic engineer.

The Oswald Lever Co., Inc., Thirteenth and Cumberland streets, Philadelphia, manufacturer of machinery and parts, has acquired the two and three-story factory at Eleventh and Cambria streets on property 198 x 200 ft., for extensions.

The Daniels Motor Car Co., Reading, Pa., has acquired property at Hunting Park Avenue, Westmoreland and Fox streets, Philadelphia, averaging about 310 x 1421 ft., for the erection of a new plant estimated to cost close to \$500,000. The total site aggregates about 6 acres and will be improved with a number of buildings. It is planned to move the present works from Reading to the new location as soon as the structures are ready for occupancy.

The Central Electric & Lock Co., 12 North Thirteenth Street, Philadelphia, will remove its works to 1309 Arch Street. Improvements are being made in the structure.

The Hess-Bright Mfg. Co., Front and Erie streets, Philadelphia, manufacturer of ball bearings, etc., has increased its capital stock from \$2,000,000 to \$2,500,000. The company has completed plans for the erection of three one-story additions, 32 x 295 ft., 24 x 350 ft., and 32 x 120 ft.

The Sarco Co., 19-21 East State Street, Trenton, N. J., manufacturer of steam specialties, is having plans prepared for a three-story addition to cost about \$20,000. Headquarters of the company are at 233 Broadway, New York.

The A. W. Walton & Son Co., Camden, N. J., has been incorporated with a capital stock of \$50,000 by Alfred W. J. Harold, and Raymond Walton, to manufacture hardware products.

The Trenton Malleable Iron Co., New York Avenue, Trenton, N. J., manufacturer of malleable and gray iron castings, etc., has increased its capital stock from \$150,000 to \$500,000.

The Bender Electric Co., 147 East State Street, Trenton, N. J., has been incorporated with a capital stock of \$125,000 by John R. D. Bower, Harry Klag, Jr., and Fred T. Walton to manufacture electrical appliances. It is considering plans for a new building to cost about \$25,000.

A dry dock and ship repair plant at Gloucester City, N. J., will be constructed by the John Baizley Iron Works, 514 South Delaware Avenue, Philadelphia, operating a large machine and boiler works. The company, it is said, will carry out the project in co-operation with a syndicate formed for this purpose. The plant will comprise two dry docks, one 550 ft. and the other 450 ft., with wet basin for six vessels, and a number of shop and construction buildings. The estimated cost is about \$5,000,000. The company has acquired a site extending from the Pusey & Jones shipyard to the Gloucester ferry, reaching back to Water Street. The City Council passed an ordinance providing for the vacation of the terminus of Fourth, Fifth and Sixth streets, at the river front, to be utilized by the new plant.

The Millersburg Reamer & Tool Co., Millersburg, Pa., has been incorporated with a capital stock of \$20,000 to manufacture reamers, taps, dies, etc. Walter A. Shatto is treasurer.

The United States Axle Co., Pottstown, Pa., has been organized to manufacture automobile axles and will take over the plant of the Industrial Foundry & Machine Co., Laurel and Washington streets, heretofore used for the manufacture of steam specialties, etc.

The Jackson Mfg. Co., Fourth and Boyd streets, Harrisburg, Pa., manufacturer of steel wheelbarrows, has commenced excavations for the main unit of its new plant, 90 x 480 ft., on property recently acquired at South Harrisburg, formerly held by the Harrisburg Rolling Mills. The structure will be one-story. It is expected to have the building ready for occupancy early in August. The Central Construction Co., 222 Market Street, has the contract.

Fire, May 5, destroyed a portion of the works of the Reading Iron Co., Birdsboro, Pa., with loss estimated at about \$100,000. Two of the mills were damaged. The plant was recently acquired from the Brooke Iron Co.

The West Penn Body Co., Wilkinsburg, Pa., has been incorporated with a capital stock of \$50,000 to manufacture automobile bodies. M. H. Mutchler is treasurer.

The Atlantic Refining Co., 3144 Passyunk Avenue, Philadelphia, has completed plans for a one-story machine and repair shop, 28 x 76 ft., at Williamsport, Pa.

The Black & Decker Mfg. Co., South Calvert Street, Baltimore, Md., manufacturer of air compressors, electric drills, etc., has established a branch at 318 North Broad Street, Philadelphia, with W. C. Allen in charge.

Bids will soon be asked by the Board of Directors, Mount Saint Mary's College, Emmitsburg, Pa., for a one-story power plant to cost about \$25,000. F. J. Baldwin, 328 North Charles Street, Baltimore, is the architect.

The General Machine & Supply Co., Trenton and Sargent streets, Philadelphia, and the Abradant Products Co., Thirtieth and Walnut streets, manufacturer of emery grinding wheels, etc., have been merged under the name of the first named company, with a capital stock of \$65,000. W. D. Glosky is president.

The Butler Elliptical Wrench Mfg. Co., York, Pa., has been formed with a capital stock of \$25,000 and is seeking a location for the establishment of a plant. George W. Rupp, superintendent of the Home Furniture Co., is treasurer and a stockholder. Other incorporators are Spencer D. Wareheim, Security Building, York, and Willis Abbott.

Buffalo

BUFFALO, May 10.

The Crosby Co., 137 Pratt Street, Buffalo, manufacturer of sheet metal stampings, has had plans prepared for a one-story brick and steel addition, 100 x 125 ft., to cost about \$50,000.

The General Drop Forge Co., 1738 Elmwood Avenue, Buffalo, has awarded a contract to the J. C. Cooper Co., Fidelity Building, for two one-story additions, 100 x 100 ft. and 60 x 100 ft. respectively, to cost about \$200,000. The larger building will be equipped as a heat treatment plant and the other as a forge shop.

The American Lux Light Co., Dunkirk, N. Y., manufacturer of lighting equipment, has filed notice of dissolution.

The Buffalo Precision & Foundry Co., 903 Mutual Life Building, Buffalo, is completing plans for a one-story machine shop, 50 x 104 ft., to be erected at Westshore and Wix avenues, at a cost of about \$15,000. W. G. Penny-jacker heads the company.

The Forged Tool Products Corporation, Jamestown, N. Y., recently incorporated with a capital stock of \$500,000 to manufacture wrenches and other forged steel products, is arranging for the erection of a new plant. The company is headed by W. H. Hjorth of William Hjorth & Co., 28-30 Taylor Street, manufacturer of wrenches, pliers, and kindred tools.

The United States Hame Co., 135 Tonawanda Street, Buffalo, manufacturer of iron and steel hames, etc., has awarded a contract to Walter Wade, 215 Main Street, for a four-story addition at Watts and Tonawanda avenues, 50 x 265 ft., to cost about \$200,000.

The Electric Rod Mill, Rome, N. Y., has been merged with the Rome Wire Co., Railroad Street, under the latter name.

The Diefendorf Gear Corporation, Syracuse, N. Y., is a new concern, of which Willis H. Diefendorf, formerly with the Weekes-Hoffman Co., is president. Temporary manufacturing space has been obtained on the top floor of the Weekes-Hoffman building.

The Jones Oil Engine Co., Syracuse, N. Y., has purchased one of the Government war buildings at Ilion, N. Y., and will dismantle it and move it to Syracuse, where it will be reconstructed and utilized for the manufacture of oil engines. New equipment probably will be required.

The Newman Machinery Co., 607 Erie County Bank Building, manufacturer of machinery and parts, is arranging for the erection of a new plant on the Indian Church Road.

The Phillips Electric Co., Rochester, N. Y., has been incorporated with a capital stock of \$100,000 by L. E. Weyrauch, W. F. and J. J. Phillips to manufacture electric equipment.

The Lacy Marine Motor Co., Rochester, has filed notice of dissolution.

The Grip-Snip Machine Corporation, Rochester, has been incorporated with a capital stock of \$125,000 by J. W. Carpehan, A. V. Lane and E. P. Milthofer to manufacture machinery and parts.

The Buffalo Chandelier Co., Buffalo, recently organized with a capital stock of \$50,000 to manufacture electric fixtures, etc., has acquired a building at Oak and Clinton streets for its new plant. J. Kaufman, 431 Delavan Avenue, heads the company.

The Hickson Electric Co., Irondequoit, N. Y., has been incorporated with a capital stock of \$50,000 by C. Klein, I. and G. P. Hickson to manufacture electrical products.

The Chenango Equipment Mfg. Co., Norwich, N. Y., has been incorporated with a capital stock of \$100,000 by W. H. Grennan, F. E. Roper and L. J. Glasgow to manufacture motors, pumps and similar apparatus.

The J. P. Danielson Co., Jamestown, N. Y., has been incorporated with a capital stock of \$300,000 by J. P. Danielson, K. Tornebohn and A. Swanson to manufacture tools, machine parts, etc.

The Iroquois Utilities Corporation, West Main Street, Gowanda, N. Y., is having plans prepared for a new electric power plant on Cattaraugus Creek, to cost about \$150,000. C. E. Eaton, Sherman Building, Watertown, N. Y., is engineer.

The Main Auto Electric Repairs Co., Niagara Falls, N. Y., has been incorporated with a capital stock of \$21,000 by G. Schmelzer, G. R. Hurse and F. P. Steglich to manufacture auto parts, electrical equipment and operate a repair works.

The Western New York Utilities, Inc., 522 Main Street, Medina, N. Y., has been granted permission to construct new electric power plants at Kendall and Barre, N. Y. The project is estimated to cost \$260,000.

Baltimore

BALTIMORE, May 10.

The initial plans of the Locke Insulator Corporation, Maryland Trust Building, Baltimore, provide for the construction of three buildings at Light and Cromwell streets, 109 x 172 ft., 140 x 340 ft., and 141 x 391 ft. respectively. The contract has been awarded to J. Henry Miller, Inc., Baltimore. Insulators, bushings, etc., will be manufactured.

William T. Hudgins, 906 Greenmount Avenue, Baltimore, will build a one-story brick machine shop, 30 x 100 ft.

The Emery Steel Co., 216 North Garrison Lane, Baltimore, manufacturer of steel castings, will build a one-story brick plant, 26 x 71 ft., at Charles and Wells streets, to cost \$2,000.

The Poole Mfg. Co., Railroad and Union avenues, Woodberry, Baltimore, has been incorporated by interests identified with the Poole Engineering & Machine Co., to manufacture machinery, including washing machines. The incorporators are S. Proctor Brady, Dudley Shoemaker and Alfred E. King.

The Maryland Equipment & Supply Co., Equitable Building, Baltimore, is in the market for 11- or 12-in. flywheels.

Plans are being made by the Automotive Tractor Corporation, Frederick, Md., to enlarge its plant.

The Simmons Hand Stoker Co., Wilmington, N. C., has been incorporated with \$100,000 capital stock to manufacture hand stokers. C. E. Hooper, Wilmington, is interested.

Quotations on 10-ton locomotive cranes will be received by the Savannah River Lumber Co., Savannah, Ga.

The Gas Engine & Electric Co., Charleston, S. C., has increased its capital stock from \$50,000 to \$100,000.

The Hagerstown Foundry Co., Hagerstown, Md., is having plans prepared for a two-story machine shop, 60 x 80 ft., to cost about \$10,000.

The W. H. Reisner Mfg. Co., 66 West Washington Street, Hagerstown, Md., manufacturer of mechanics' appliances, musical instruments, etc., will build a three-story brick addition, 38 x 104 ft.

The Speakman Co., 816 Tatnall Street, Wilmington, Del., manufacturer of steam supplies, etc., has awarded a contract to J. E. Healy & Sons, Inc., 707 Tatnall Street, for a one-story foundry, 30 x 100 ft., at Thirtieth and Spruce streets, to cost about \$15,000.

The Federal Motor & Sales Co., 803 Low Street, Baltimore, has awarded a contract to the J. L. Robinson Construction Co., 1130 West Lafayette Street, for the erection of a three-story service and repair building, 106 x 115 ft., at North Avenue and Lord Street, to cost about \$100,000.

The National Enameling & Stamping Co., Race and Ostend streets, Baltimore, is planning for a three-story and basement addition, 61 x 76 ft., to cost about \$100,000, including equipment.

Fire, May 1, destroyed a number of buildings at the plant of the Crisfield Shipbuilding Co., Crisfield, Md., with a loss estimated at \$45,000. The buildings destroyed include machine shop, mechanical repair shop, warehouses and other structures.

The National Steel Rolling Co., 203 Keyser Building, Baltimore, is arranging for the erection of a one-story plant, 60 x 120 ft. R. F. Baldwin is head.

Fire, April 29, destroyed a portion of the plant of the Ejecto File Co., High Point, N. C., with loss reported in excess of \$100,000.

The Atlanta Metallic Casket Co., Atlanta, Ga., has been incorporated with a capital stock of \$100,000 by C. R. Fox and N. P. Cannon, to manufacture metal burial caskets, etc.

A one-story electric power plant to cost about \$50,000

will be erected by the Reynolds Tobacco Co., Winston-Salem, N. C.

The United Cigarette Machine Co., Lynchburg, Va., is establishing a plant to be equipped for an initial production of about 300 machines a year.

Chicago

CHICAGO, May 10.

The market has been exceptionally dull the past week, evidently reflecting a diminishing disposition to buy in the face of extended deliveries and uncertain railroad shipments. That consumers will place orders when they are sure of prompt delivery was indicated in an auction on May 4, of equipment in the die and tool shop of the Krasberg Engineering & Mfg. Co., 536 Lake Shore Drive. Standard machine tools, valued at \$200,000, were disposed of at close to present prices for new equipment, most of the purchasers being users. In a few cases, in fact, the full market for new machines was paid.

No action has yet been taken on the several lists mentioned in this column in recent weeks, but the Burlington and the Rock Island are expected to close on their inquiries shortly. The latter road has added a few machines to the list published a week ago. For Silvis, Ill., it wants a motor-driven 14-in. x 44-in. x 12-ft. planer and for Estherville, Iowa, it is advertising for a belt-driven 36-in. x 36-in. x 12-ft. planer and a belt-driven 1½-in. double head bolt cutter for threading bolts from ¾-in. to 1½-in.

Probably the largest single inquiry which has appeared the past week comes from the F. M. Duncan Co., 114 East Ohio Street, Chicago, and calls for a 30-in., 48-in. and 72-in. boring mill; 16-in. x 6 ft. engine lathe, 12-in. or 14-in. shaper, 4-ft. radial drill, small grinding machine, 14-in. floor drill and a metal-cutting band saw.

The transportation situation has improved in Chicago and West of this city, but is still decidedly unsatisfactory East of the Illinois-Indiana State line. A Cleveland manufacturer of turret lathes recently shipped to Chicago by boat because of the uncertainty of movement by rail. The delivery problem has been further complicated by the machinists' strike in Cincinnati.

In Chicago there have been no general difficulties with shop men, but here and there a strike has been called. Two local users of machine tools, R. Williamson & Co., manufacturer of lighting fixtures, and the Peerless Light Co., have been crippled by strikes.

Two more price changes are noted. A maker of turret lathes advanced prices 15 per cent, effective May 1, and another turret lathe manufacturer raised quotations 12½ per cent, effective May 15.

Except in terms of dollars, building construction for April shows a decline as compared with the same month last year. The number of permits issued in this city in April, 1920, was 521, involving a frontage of 18,344 ft. and a cost of \$9,060,500, as against 795 last year, involving 20,200 ft. and \$7,447,800.

The La Salle Steel Co., 2243 South Halsted Street, Chicago, is receiving bids through Ronneberg, Pierce & Hauber, engineers and architects, 10 South La Salle Street, on a \$250,000 manufacturing plant at 150th Street and Indiana Harbor Belt Railroad, Hammond, Ind.

The O. K. Giant Battery Co., Gary, Ind., is receiving bids through Z. Erol Smith, 305 East Fifty-fifth Street, Chicago, on a one-story plant, 50 x 400 ft., West Gary, Ind. The estimated cost is \$60,000, but ten other structures of similar dimensions are planned which will bring the investment up to \$660,000.

The Hafner Mfg. Co., manufacturer of toys, 400 North Lincoln Street, Chicago, is having plans drawn by F. O. DeMoney, 5 North La Salle Street, for a one-story plant, 66 x 160 ft., Carroll Avenue, near North Kedzie Street, to cost \$50,000.

The Vulcan Louisville Smelting Co., 208 South La Salle Street, is having plans prepared for a one-story plant for temporary use to replace the section of its factory at North Chicago, Ill., which was recently destroyed by fire.

The American Wall Bed Co., 1339-45 West Twenty-first Street, Chicago, has let contract for a one-story plant, 30 x 111 ft., at 1434-38 West Twenty-first Street, to cost \$6,000.

F. W. Clement, 941 North Robey Street, Chicago, has let contract for a two-story machine shop, 22 x 24 ft., to cost \$4,600.

The Edward Katzinger Co., 123 North Sangamon Street, Chicago, manufacturer of bakers' tools and machinery, will build a seven-story plant to cost \$200,000.

The Barrows Lock Co., Lockport, Ill., has increased its capital stock from \$300,000 to \$500,000.

The Illinois Iron & Metal Co., Pekin, Ill., has commenced the erection of a plant.

The Falcon Mfg. Co., Big Rapids, Mich., is constructing a two-story addition, 42 x 100 ft., to be used as a machine shop.

The Northern Machine Co., recently organized for a general repair business and job work, has completed a machine shop on Haring Street, Cadillac, Mich. L. T. M. Foster is president.

The Calhoun Castings Co., Battle Creek, Mich., has been incorporated to manufacture gray iron castings and has secured the old American Column Co. buildings, which will be remodeled. A general jobbing business will be done. The officers are: President, M. J. Franklin; vice-president, Harry T. Ritchie; secretary and treasurer, Ernest T. Rice.

The Judy Mfg. Co., Centerville, Iowa, will construct a foundry, 60 x 150 ft.

The Adix Mfg. Co., Boone, Iowa, has been incorporated with \$250,000 capital stock to manufacture farm equipment. A two-story plant, 72 x 100 ft., will be erected at Tenth and Tama streets. Temporary officers are A. W. Adix, president, G. W. Haglund, vice-president, and F. D. Adix, secretary-treasurer.

Shrauger & Johnson, Atlantic, Iowa, have commenced the construction of a one-story foundry, 110 x 200 ft.

The Modern Foundry & Machinery Co., Minneapolis, Minn., has been organized to operate a light gray iron and semi-steel foundry. Property has been purchased at Hiawatha Avenue and Thirty-second Street South, where a plant will be constructed. The output will be confined largely to light castings. L. J. Bedard is president.

Henry E. Pridmore, 1901 South Rockwell Street, Chicago, manufacturer of presses and other machinery, is having plans prepared for a one-story foundry addition, 60 x 160 ft., to cost about \$100,000, including equipment.

The Ajax Forge Co., Chicago, a Delaware corporation, has increased its capital stock from \$1,750,000 to \$3,000,000.

The Dempster Mfg. & Supply Co., Des Moines, Iowa, manufacturer of pumps, etc., has awarded contract to A. H. Newmann & Co., Hubbell Building, for a one-story brick and steel addition, 120 x 175 ft., to cost about \$100,000. It will be equipped as a machine shop and foundry.

The White Lily Mfg. Co., Davenport, Iowa, manufacturer of electric-operated washing machines, has arranged for the immediate erection of a one-story plant, 210 x 285 ft., on Rockingham Road. A power plant will also be constructed. The works will cost about \$200,000.

The Sewell Cushion Wheel Co., Detroit, manufacturer of automobile wheels, has filed plans for a new branch plant at 2711-17 South Wabash Avenue, Chicago, to cost about \$35,000.

The Groetken Pump Co., 171 Middle Avenue, Aurora, Ill., is considering plans for an addition, 75 x 100 ft., to cost about \$50,000.

The National Refining Co., Coffeyville, Kan., is building a boiler house. S. A. White is the purchasing agent and H. B. Setzler is general superintendent.

Cleveland

CLEVELAND, May 10.

The demand for machine tools shows a decided slump, which is attributed for the most part to the railroad strike. Considerable prospective business is being held up as manufacturers have little encouragement to buy additional machinery when they cannot get enough material to keep their present equipment running at capacity. These conditions, however, are not affecting some of the larger projects involving the purchase of machinery for new plants and extensions. Henry Ford & Son placed an order with a local machinery house the past week for 40 drilling machines for their tractor plant at Dearborn, Mich., and the National Acme Co. purchased about 20 14-in. engine lathes for its extension. The Toledo Machine & Tool Co. is reported to be in the market for a round lot of machinery for its new plant. The demand for drilling machines and boring mills continues fairly active. One of the effects of the railroad strike is that considerable machinery consigned to manufacturers in this district and to dealers is being held up, and local dealers are unable to make shipments from their store rooms.

The Aluminum Manufacturers, Inc., Cleveland, formerly the Aluminum Castings Co., has sold its Carnegie Avenue plant to the Oster Mfg. Co., and has moved its general offices to its Harvard Avenue works. It will give up possession of the brass foundry May 15, and will continue to operate its Carnegie Avenue aluminum foundry until Nov. 15. Among the recent changes in the organization is the election of

George J. Stanley, formerly with the Aluminum Co. of America, as vice-president and treasurer. No production manager has been chosen to succeed Paul Ryan, who recently resigned to become manager of the Perfection Spring Works of the Standard Parts Co., but F. A. Parkhurst, who was associated with the company several years ago, has become affiliated with it, devoting a portion of his time as organization engineer and assumes some of the duties that were formerly under the direction of Mr. Ryan.

The Hanson Mfg. Co., 1104 Prospect Avenue, Cleveland, maker of air valves, has acquired a site at 1786 East Twenty-seventh Street, where it will erect a plant.

The National Bronze & Aluminum Foundry Co., Cleveland, has under construction the first unit of a new plant, 150 x 200 ft., on a new site at the Belt Line Railroad and East Ninety-third Street, and has placed a contract for further extension. The company expects to be in its new quarters in about 30 days.

The Kelly Reamer Co., Cleveland, which is erecting a new plant at 3705 West Seventy-third Street, has elected the following officers: A. C. Putnam, president; H. J. Wilke, vice-president; J. M. Davie, manager; A. C. Carter, secretary; George Moore, assistant secretary, and H. W. Strong, treasurer.

The Ohio Brass Co., Mansfield, Ohio, will erect a malleable foundry, contract for which has been placed with the Shell-Wolfe Construction Co., Mansfield. It will have a floor space of 80,000 sq. ft. and will take care of the entire malleable iron needs of the company.

The Kenney Foundry & Mfg. Co., Lexington, Ohio, has acquired a factory, 75 x 175 ft., which it is rebuilding for a machine shop, pattern shop and power plant, and in addition is erecting a foundry, 90 x 160 ft., and a pattern and storage building, 30 x 40 ft. The new plant will replace the one burned a few months ago.

The Defiance Motor Truck Co., Defiance, Ohio, is planning for the erection of an addition.

The Canton Rim Co., Canton, Ohio, has increased its capital stock from \$100,000 to \$500,000 and will build extensions to its plant.

The Lucius Reinforced Tank Co., Massillon, Ohio, manufacturer of welded steel products, will erect a new plant on Columbia Heights. C. J. Roberts, formerly assistant sales manager Toledo Sales Co., is secretary and general manager.

The Miller Foundry Co., Medina, Ohio, has changed its name to the Henry Furnace & Foundry Co.

The stockholders of the Aetna Foundry & Machine Co., Warren, Ohio, at a recent meeting voted to increase the capital stock from \$50,000 to \$300,000, of which \$100,000 will be issued at once. Shares of the new issue will be offered to present stockholders on a pro-rata basis. Of the first issue \$60,000 of the proceeds of the sale will be used for additional working capital made necessary by the increase in the volume of business, and \$40,000 will be used for improvements to the plant and additional equipment. Full production will be reached by July 1, at which time the sales will amount to over three times those for the same period last year.

Cincinnati

CINCINNATI, May 10.

Notwithstanding that a number of shops are partially or wholly affected by the machinists' strike, orders for machine tools continue in good volume. While no large lists have been received the past week, bookings for one and two machines have been up to the average of the last three weeks and manufacturers are well satisfied with conditions. The General Electric Co. purchased a number of tools in this city the past week, and the American Locomotive Co. is inquiring for machines which, it is reported, are destined for export. So far no action has been taken on the lists issued by the various railroads, though it is expected that the Norfolk & Western will purchase within the next week or two.

The Smith Gas Engineering Co., Dayton, Ohio, will increase its capitalization from \$450,000 to \$1,500,000, with an additional \$1,000,000 authorized for future expansion. Its main plant is located at Moraine City and a branch is operated at Lexington, Ohio. The company manufactures gas producing machinery for use in connection with glass furnaces, steel mills, etc. The increased capitalization is for the purpose of adding several departments for the manufacture of machinery included in complete installations, but which is now purchased from outside firms.

The Springfield Finished Castings Co., Springfield, Ohio, has been incorporated with a capital stock of \$75,000 by T. R. and T. W. Ludlow, J. Turner, G. F. Ilgen and W. E. Showalter.

The Columbus Malleable Iron Co., Curtis Avenue, Colum-

bus, Ohio, is building a one-story addition, 19 x 41 ft., to cost about \$10,000.

The Jeffrey Mfg. Co., Columbus, recently awarded a contract for a one-story extension, 215 x 253 ft., to its machine shop, to the R. H. Evans Co. It will be of steel and brick and is estimated to cost \$166,000. The Middle States Construction Co. has the contract for a one-story addition, 51 x 56 ft., to the boiler house.

The Steel Products Engineering Co., Springfield, Ohio, has commenced the erection of a one-story addition, 62 x 153 ft., to its plant at Columbia and Isabelle streets. It will be used for the manufacture of aeroplane motors, the company having recently put out a new type.

The Dayton Malleable Iron Co., Dayton, Ohio, has increased its capital stock to \$2,000,000. The company has acquired property at Columbus for the operation of a branch plant.

The Franz Foundry & Machine Co., Barberton, Ohio, is taking bids for a one-story addition, 150 x 210 ft., to cost about \$150,000.

Detroit

DETROIT, May 10.

Formal notice has been filed with the Michigan Secretary of State of the proposed reorganization of the automobile and tractor business of the Ford Motor Co., which is to be consolidated and incorporated as a \$100,000,000 Delaware corporation. The new company will also manufacture aircraft, internal combustion locomotives and railroad cars. The capital stock, it is understood, will be held by Henry Ford, Edsel Ford and Mrs. Henry Ford. The incorporation is in Delaware because the Michigan statute does not permit organization of a company with more than \$50,000,000 capitalization.

The Marshall Furnace Co., Marshall, Mich., which has increased its capitalization to \$150,000, is contemplating the erection of an addition.

The Swedish Crucible Steel Co., Hamtramck, Mich., is having plans prepared for a four-story addition, 100 x 200 ft., to cost about \$200,000.

The Jansen Mfg. Co., Detroit, manufacturer of belting, is having plans prepared for a two-story addition, 75 x 100 ft., to cost about \$50,000.

The Manistee Drop Forge Co., Manistee, Mich., will add \$100,000 to its capital stock, making the total \$300,000.

The Field Mfg. Co., Owosso, Mich., manufacturer of motor truck bodies, will sell \$200,000 worth of stock to finance its expansion program.

The Flint Foundry Co., Marshall, Mich., which is adding to the facilities of its plant, will issue \$50,000 of preferred stock to cover part of the cost of the improvements.

The manufacturing division of the W. J. Baird Machinery Co., Detroit, will probably be moved from Detroit to Fenton, Mich., in the near future, where it has been offered a 4-acre site and other advantages. Its sales department will be maintained in Detroit. Inflated real estate values, cramped manufacturing conditions and excessive wage scales in Detroit are instrumental in causing the company to move.

The equipment of the recently closed Jennings Brothers machine shops, Jennings, Mich., has been taken over by the Northern Machine Co., Cadillac, Mich., which will conduct a general machine and metal manufacturing business.

The E. A. Nelson Automobile Company, Detroit, is offering for sale 176,000 shares of its 200,000 authorized capital shares, the proceeds to be used to increase production facilities.

The Columbia Motors Co., Detroit, has outgrown its plant at Mack and Beaufort avenues, and it is proposed to build a new factory fronting 400 ft. on Fort Street and 700 ft. on Boyd Street. At the rear will be located the power plant, cold storage and several small buildings, including an employees' cafe and recreation room. The company plans to retain its present buildings for manufacturing and storage purposes.

Morgan & Wright, Bellevue Avenue, Detroit, manufacturer of automobile tires, has awarded contract to Stone & Webster, Detroit, for a nine-story brick and steel plant on Jefferson Avenue, to cost in excess of \$2,500,000, including equipment.

Fire, May 4, destroyed the plant of the Curtis Tire & Rubber Co., Muskego, Mich., with loss reported at \$500,000.

The Fisher Body Co., Oakland Street, Detroit, manufacturer of automobile bodies, is having plans drawn for a new six-story plant, 72 x 970 ft., on West End Avenue.

The Aero Cushion Inner Tire & Rubber Co., Ford Building, Detroit, manufacturer of automobile tires, has awarded contract to F. R. Patterson, Ford Building, for a one-story plant at Saginaw, Mich., 80 x 200 ft., to cost about \$75,000. J. J. O'Shaughnessy is general manager.

The Jackson Screw Products Co., 213 East Washington Avenue, Jackson, Mich., has awarded a contract to North & Griffin, for a one-story plant, 50 x 120 ft.

Pittsburgh

PITTSBURGH, May 10.

The Gearless Motor Co., Pittsburgh, has awarded a contract to Peter Schmidt, 36 Mount Oliver Way, Mount Oliver, for a one-story plant, 32 x 192 ft., on Flavel Street, East Liberty, for automobile assembling work. George O. Rogers, Hartje Building, is the architect.

The Cambria Steel Co., Widener Building, Philadelphia, has completed plans for a one-story building at Johnstown, Pa., 60 x 140 ft., to be equipped as an electrical repair shop.

The Home Electric Appliance Co., Pittsburgh, manufacturer of electrical equipment, a Delaware corporation, has increased its capital stock from \$50,000 to \$250,000.

The United States Radiator Co., Detroit, Mich., is having plans prepared for two one-story additions at West Newton, Pa., 80 x 210 ft. and 70 x 220 ft., to cost about \$50,000.

The Somers, Fittler & Todd Co., 327 Water Street, Pittsburgh, manufacturer of machinery, has taken title to two lots on Water Street, each 20 x 161 ft., with consideration of \$68,000 and \$42,500 respectively. The company will erect an eight-story building to cover the entire plot.

The Kearns-Dughie Motors Corporation, Beavertown, Pa., has been incorporated with a capital stock of \$100,000 to manufacture automobile motors, parts, etc. M. V. Dughie, Lewistown, is treasurer.

A. R. Platt, 3575 Higelow Boulevard, Pittsburgh, has awarded a contract to Toupet Beil & Conley Co., 5814 Ellsworth Avenue, for a one-story plant, 60 x 160 ft., at Taylor and Friendship avenues, to cost about \$30,000, for the manufacture of automobile parts, equipment, etc.

The Serena Mfg. & Plating Co., McKeesport, Pa., has been incorporated in Delaware with a capital stock of \$60,000 by Harry H. Serena, McKeesport, and Walter Gauser, Duquesne, Pa., to manufacture patented metal holding devices for shades, curtains, etc.

The Consolidated Fuel Co., Pittsburgh, has acquired the Smoot Creek mines at Jellico, Tenn., and plans the installation of new electrically operated mining machinery for the entire property. A housing development totaling about 100 houses is also planned.

The Colborn Safety Device Co., Fairmont, W. Va., has been incorporated with a capital stock of \$100,000 by W. D. Stockly, George T. Watson and J. E. Evans to manufacture safety appliances, automatic cut-off devices, etc.

The Charles Phillips Tool Co., Mannington, W. Va., has completed plans for a one-story machine shop and forge shop.

The National Electric Service Co., Morgantown, W. Va., has been incorporated with a capital stock of \$50,000 by John R. Campbell, Morgantown; Daniel A. Maurer and Walter E. Watkins, Fairmont, W. Va., to manufacture electrical specialties.

A new electric power plant to cost about \$100,000 will be erected by the Interwoven Mills, Inc., at Martinsburg, W. Va. Headquarters of the company are New Brunswick, N. J.

The Central South

ST. LOUIS, May 10.

The Valley Electrical Co., St. Louis, S. A. Whiten, president, 754 Arcade Building, will erect two buildings, 50 x 200 ft. and 32 x 80 ft., for the manufacture of electrical apparatus.

The Gravois Foundry & Machine Co., St. Louis, will rebuild its foundry recently burned with a loss of \$80,000.

The Eureka Brass Co., St. Louis, 615 Red Bud Avenue, will erect an addition, 50 x 148 ft.

The Oklahoma Steel Casting Co., Tulsa, Okla., will equip a plant for a daily output of 100 to 125 tons. An electric crane will be installed.

The Shepherd Motor Co., Enid, Okla., R. A. Shepherd and others interested, will install about \$50,000 worth of equipment for the manufacture of motors.

The American Bed Co., 1820 Park Avenue, St. Louis, will build a two-story, 75 x 130 ft., addition for the manufacture of metal beds.

The Sterns Tire & Tube Co., 2100 Krenlin Avenue, St. Louis, manufacturer of automobile tires and tubes, has completed plans for two new buildings at Wellston, Mo., each one-story, 30 x 175 ft. and 30 x 40 ft. respectively, to cost about \$40,000.

The St. Louis Blow Pipe Co., Ninth and Chamber streets,

St. Louis, has awarded a contract for a one-story addition, 80 x 140 ft., to F. H. Eldman, 1908 Adelaide Avenue. It is estimated to cost \$15,000.

The Kentucky Motor Sales Co., 628 South Third Street, Louisville, is taking bids for the erection of a one and two-story service and repair building, to cost about \$50,000.

The Forrest City Compress Co., Forrest City, Ark., is planning for the establishment of a new plant to cost about \$50,000.

The Lawrence Tank Corporation, Lawrence, Okla., has been incorporated with a capital stock of \$60,000 by F. G. Larrance, Sr. and Jr., and C. P. Gibson, to manufacture tanks and other equipment.

The Sapulpa Motor Co., Main and Hobson streets, Sapulpa, Okla., is having plans prepared for a two-story service and repair building, 120 x 150 ft.

The Guffey & Gillespie Oil Co., Tulsa, Okla., is planning for the establishment of a new one-story machine shop.

Indianapolis

INDIANAPOLIS, May 10.

The Stevenson Gear Co., 942 Daly Street, Indianapolis, plans to erect a new building to house about 60 gear-cutting units. The company cuts commercial gears by a patented Stephenson multiple process.

The Strongcord Tire & Rubber Co., Evansville, Ind., will build a new factory to cost \$250,000, of which \$150,000 will be spent for equipment. S. W. Stermont is president.

The Columbus Iron Works, Columbia City, Ind., will build a brass foundry, 40 x 60 ft.

The Kokomo Malleable Iron Foundry, Kokomo, Ind., has been incorporated with \$350,000 capital stock to manufacture malleable iron products. The directors are Edward Bridges, A. G. Seiberling and J. W. Johnson.

The Lincoln Way Brass Foundry Co., South Bend, Ind., has filed certificate of dissolution.

The Federal Steel Products Co., Indianapolis, has increased its capital stock from \$100,000 to \$500,000.

The Matthews-Banner Range Co., South Bend, Ind., has been incorporated with \$200,000 capital stock to manufacture stoves and ranges. The directors are Lewis C. Matthews, Daniel J. Matthews and Walter A. Mortensen.

The Freeman-Riff Co., Chicago, manufacturer of conveyors, conveying machinery and mine supplies, has bought a factory site at Terre Haute, Ind.

The Northall Nonpuncture Tire Co., Evansville, Ind., has been incorporated with \$200,000 capital stock to manufacture automobile tires. The directors are Frank Schwegmann, Samuel C. James and Gertrude Northall.

The Rice Hub & Rim Co., Marengo, Ind., has increased its capital stock from \$20,000 to \$50,000.

The Berry Mfg. Co., Evansville, Ind., incorporated with \$50,000 capital stock, will manufacture dispensers for gasoline and oil and for soda water fountains. The incorporators are Edward H. Meyer, William P. Walsh and William J. Rodgers.

Milwaukee

MILWAUKEE, May 10.

Deliveries are perhaps the most important problems confronting machine tool manufacturers. Manufacturers have enough orders on their books to keep them busy for 90 days or longer, with new business being received in generous volume. The local labor situation is quiet, but all shops are far short of the number of men required for prompt execution of orders. The coal situation has been relieved, but remains unsatisfactory in respect to prompt replenishment of supplies of fuel. The traffic tangle is gradually being unwound, but shipments to Eastern points are still subject to harassing delays.

The Turner Mfg. Co., Port Washington, Wis., has contracted with Frank D. Chase, Inc., 645 North Michigan Avenue, Chicago, to design and erect a brick and steel foundry addition, 60 x 150 ft., and a two-story machine shop addition, 40 x 90 ft., to increase its output of gas engines, tractors, etc. Inquiry is being made for a considerable list of miscellaneous equipment. W. A. Engelhart is works manager.

The Simmons Co., Kenosha, Wis., manufacturer of metal bedsteads and bed-springs, with branch factories at San Francisco, Atlanta, Elizabeth, N. J., and a Canadian plant, is increasing its authorized capital stock from \$20,000,000 to \$100,000,000. Z. G. Simmons is president.

The Alfred C. Goethel Co., 301-303 Fourth Street, Milwaukee, manufacturer of blower systems and other sheet

metal products, will let contracts this week for the first unit of a new factory on Thirty-second Street, between North and Meinecke avenues. It will be 60 x 120 ft., one-story and basement, and was designed by John Menge, Jr., architect, 138 Wright Street.

The Geuder-Paeschke & Frey Co., Milwaukee, manufacturer of stamped and enameled ware, will build an ell-shaped addition, 95 x 365 x 244 ft., at Fifteenth Street and St. Paul Avenue. With new equipment the work will cost about \$80,000.

The Lavine Gear Co., Keefe Avenue, Milwaukee, has placed the general contract with Frank Luenzmann Co., 1912 Prairie Street, for a one-story machine shop addition, 50 x 153 ft. It manufactures steering gears and other automotive parts. Herman A. Uhllein, 521 Grand Avenue, is president.

The Oshkosh Motor Truck Co., Oshkosh, Wis., has broken ground for the first unit of its new factory on a new site. It will be 102 x 410 ft., of brick and steel. Auler & Jensen, Oshkosh, are the architects.

The Western Metal Specialty Co., 102 Wisconsin Street, Milwaukee, has increased its capital stock from \$75,000 to \$100,000. The factory at 1919 St. Paul Avenue is undergoing enlargement.

The Waukesha Brass Foundry Co., Waukesha, Wis., expects to take occupancy of its new casting shop shortly after June 1. It is 50 x 260 ft., of brick and steel, and will cost about \$35,000. New furnace equipment, with Westinghouse auxiliaries, has been purchased. The present capacity will be increased 100 per cent. C. C. Smith is president and general manager, and E. J. Doyle, works manager.

The Greene Engineering Co., Racine, Wis., which recently completed additions to its machine and structural shops, has increased its capital stock from \$35,000 to \$100,000. F. J. Greene is president, and James Easson, secretary and treasurer.

The Plymouth Foundry & Machine Co., Plymouth, Wis., has acquired the former City Hall, which is being converted into an office building. The present offices will be remodeled into shop additions, increasing the floor space about 4000 sq. ft.

The Rundle Mfg. Co., Twenty-seventh and Janesville avenues, Milwaukee, manufacturer of enameled sanitary ware, has increased its capital stock from \$350,000 to \$750,000. It has been enlarging its works the last six months and contemplates further extensions from time to time. Robert T. Hazelwood is president.

The Andis Tool Co., Racine, Wis., has increased its capital stock from \$25,000 to \$50,000 and changed its corporate style to the Andis O. M. Mfg. Co. It is engaging in the manufacture of electrical appliances in addition to tools, jigs, dies, etc., and is installing a small list of equipment. Matthew Andis is president, and John Oster, secretary and treasurer.

The F. Rassmann Mfg. Co., Beaver Dam, Wis., manufacturer of farm implements and parts, is rebuilding the molding floor of its gray iron foundry, which was recently badly damaged by fire. The capacity is being increased about 35 per cent.

The Vulcan Mfg. Co., Fond du Lac, Wis., has appropriated \$25,000 for the construction and equipment of an addition to its structural and ornamental iron works. Plans are in preparation.

The Milwaukee Gas Specialty Co., 2107 Clybourn Street, Milwaukee, has plans for a one-story brick and mill addition, 50 x 115 ft., with full basement. It makes gas appliances for domestic and industrial purposes. A. O. Rutz is president.

The C. & G. Mfg. Co., Milwaukee, has been incorporated with a capital stock of \$100,000 to manufacture automatic machinery and metal products. The incorporators are Edward Cheshire, Berlin, Wis., and Robert G. Kohlsdorf and L. Hohl of Milwaukee.

The Cornell Wood Products Co., Cornell, Wis., has broken ground for a two-story machine room, 44 x 319 ft., and a finishing room, 35 x 88 ft. The work is in charge of L. A. DeGuere, consulting engineer, Grand Rapids, Wis. R. P. Pierce is general manager.

The Pillar Products Co., Milwaukee, has been organized with a capital stock of \$25,000 to manufacture metal products, machinery parts, etc. The incorporators are Arthur Snapper, Nina B. Pillar and George B. Pillar, 576 Wentworth Avenue.

The Board of Education, Sheboygan, Wis., is taking bids until June 1 for the construction of a high school and vocational training institute to cost about \$750,000. The architects are Childs & Smith, Chicago.

The Board of Education, Racine, Wis., has adopted plans by Edmund B. Funston & Co., local architects, for a three-story addition, 135 x 240 ft., to the Washington School, to be equipped as a junior high and vocational training insti-

tute. It is estimated to cost about \$200,000. Bids will be taken late in May. Joseph J. Moritz is secretary of the board.

The Menominee Motor Truck Co., Menominee, Mich., which will transfer its operation to a new factory being erected at Clintonville, Wis., has disposed of its present plant to Charles Janson, proprietor of the Ford Garage, Menominee, who is to occupy the three-story structure as a salesroom, garage, service shop, and manufacture commercial car bodies and automotive accessories. Possession will not be given until June 1 or 15.

The Racine Engineering Co., Racine, Wis., has been organized to engage in general automotive engineering in relation to the farm machinery and tractor industries. Offices have been opened at 105 Badger Building. The principals are L. N. Burns, formerly vice-president and sales manager J. I. Case Plow Works Co.; A. Y. Dodge, who will be chief engineer, and H. L. Taitte, a mechanical engineer also formerly with the Case company.

The Lauchin-Loehr Piston Co., Green Bay, Wis., has increased its capital stock from \$25,000 to \$50,000 and will enlarge its floor space and equipment to double the output of self-lubricating pistons for high speed gas engines. George Y. Lauchin is president and chief engineer.

The Board of Education, St. Croix Falls, Wis., will take bids about June 1 for a two-story brick and concrete junior high school and industrial training institute, costing about \$100,000 and designed by W. L. Alban, architect, 347 Endicott Building, St. Paul, Minn.

The Board of Education, Washburn, Wis., has engaged John D. Chubb, architect, Chicago, to design a new high school, 100 x 165 ft., two stories and basement, with manual training shops, and to cost \$150,000. Bids will be taken about June 15.

The Northern Casket Co., Fond du Lac, Wis., which some time ago decided to postpone a \$135,000 plant extension project awaiting more stabilized conditions, has now awarded the contract for the work to the Immel Construction Co., local. It includes a three-story brick factory addition, 100 ft. sq., a boiler house, 52 x 60 ft., and a private garage and machine shop, 30 x 60 ft.

California

SAN FRANCISCO, May 4.

Freight conditions, due to the switchmen's strike, are holding back shipments of machinery, and keeping sales at a low ebb. It is apparent that those who are contemplating improvements are comparing prices between the cheaper grades of machinery and those whose initial costs are higher.

The Southern Pacific and Santa Fe railroads have plans for large expenditures for improvements and equipment, but it is estimated that comparatively little will go into new machinery.

Holbrook, Merrill & Stetson, San Francisco, manufacturers of stoves, furnaces and allied products, are building an addition, 137 x 275 ft., costing approximately \$500,000.

The Doble Co., Inc., Emeryville, has been incorporated with a capital stock of \$100,000 by John A. Jr., William A. and Warren Doble, George A. Sargent and E. M. Mason, all of San Francisco. It will immediately erect a plant at Emeryville, Cal., for the manufacture of engines, tractors, vehicles and water craft.

The C. E. Hill Co., Oakland, has been incorporated with a capital stock of \$10,000 by C. E. Hill, C. E. S. Hill and A. H. Jordan to manufacture dairy machinery and supplies.

The C. L. Best Gas Traction Co., San Francisco, whose plant is located at San Leandro, is offering \$1,250,000 preferred stock and proposes to double the size of its plant.

The All-in-One Tractor Co., Oakland, manufacturer of farm tractors, is contemplating the erection of a new plant at Woodland, Cal.

The Standard Drop Forge Co., Oakland, has been incorporated with a capital stock of \$1,000,000 by E. I. de Levenaga, San Francisco; Clarence L. Johnson, Oakland; Walter W. Johnson, Berkeley; Walter D. Cole, Oakland; V. C. Ray, Oakland, and A. W. Shepherd, Berkeley. A plant will be established in Oakland to manufacture forgings.

The Shell Oil Co., San Francisco, will make additions to its refinery at Martinez, which will double the size and capacity of the plant and cost over \$1,250,000.

The Bushnell Mfg. Co., Berkeley, has been incorporated with a capital stock of \$50,000 by John B. Bushnell, Edward J. Hultman and W. T. Merriman and will establish a motor vehicle plant.

The Cole Visible Gas Gauge Co., Los Angeles, has been

incorporated with a capital stock of \$50,000 by Clifford M. Cole, N. M. Smith and Harry A. Unger, to manufacture automobile appliances, gages, etc.

The Vulcan Electric Co., Los Angeles, has been incorporated with a capital stock of \$200,000 by W. W. Sweeney, I. W. Gleason and H. A. Masac, to manufacture electrical specialties.

The National Radio Co., 156 Second Street, San Francisco, manufacturer of wireless equipment, has awarded contract to Ruegg Brothers, Pacific Building, for a one-story plant at North Twentieth Street, to cost about \$40,000.

The M. & M. Machine Co., Wilmington, Los Angeles, has been organized to manufacture machinery and parts, D. G. MacGregor, 1340 Florida Street, Long Beach, heads the company.

The Saffell Water Heater Mfg. Co., 1310 South San Pedro Street, Los Angeles, has filed notice of organization to manufacture water heaters and other specialties. A. H. Saffell heads the company.

The Jonas-Neihoff Mfg. Co., Los Angeles, has been incorporated with a capital stock of \$50,000 by F. W. Jonas, J. A. Neihoff and M. M. Fogel, Santa Monica, to manufacture automobile parts, carburetors, etc.

The Staweld Welding Corporation, Los Angeles, has been incorporated with a capital stock of \$100,000 by Charles T. Kennedy, Thomas Pyler and H. A. Kennedy to manufacture welding apparatus.

The Union Oil Co., Union Oil Building, Los Angeles, is planning for the erection of a new pumping plant at its ship-loading works at San Pedro Harbor, to cost about \$15,000.

The Gulf States

BIRMINGHAM, May 10.

The Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., is said to be planning for the erection of freight car shops, estimated to cost in excess of \$1,500,000. Horace M. Lane, Detroit, Mich., is engineer for the company.

The Midland Brass Works, Fort Worth, Tex., has been incorporated with a capital stock of \$25,000 by Arthur D. Modgson, W. B. Sloan and J. L. Boicourt, to manufacture bronze, brass and kindred products.

The Houston Blow Pipe & Sheet Metal Works, Houston, Tex., has increased its capital stock to \$20,000.

The Orange Iron Works, Front and Mill streets, Orange, Tex., is planning for the erection of additions to cost about \$40,000.

The Southland Cotton Oil Co., Temple, Tex., is planning to rebuild its cottonseed oil works on a larger scale. The new plant will be electrically operated and is estimated to cost about \$60,000. E. A. Dill is engineer.

The Shippers' Bonded Compress Co., Albany, Ala., recently organized, is planning for the erection of a cotton compress plant to cost about \$250,000, including equipment. R. F. Willingham is president.

The Galveston Wharf Co., Galveston, has contracted with J. W. H. Steele for the construction of six high-density cotton compresses upon its wharf. Complete monorail and electric loading equipment will be installed. Plans call for an initial expenditure of about \$500,000.

The Cibola Farmers' Gin Co., Cibola, will construct a cotton gin to cost \$30,000. E. J. Itapper is a stockholder.

The Petronilla Cotton Gin Co., Robstown, will build a cotton gin to cost \$20,000. The incorporators are L. B. McCain, W. S. Stephenson and W. B. McBurnett.

The Diamond Auto Supply Co., San Antonio, has been incorporated with a capital stock of \$150,000 by W. R. Sein, P. G. Caldwell and R. E. Isem.

The capital stock of the Stockham Pipe & Fitting Co., Birmingham, Ala., has been increased from \$3,000,000 to \$5,000,000.

The Union Foundry Co., Anniston, Ala., wants prices on lathes and pattern planers.

The Louisiana & Northwestern Railroad, Homer, La., will rebuild its burned shops, requiring about \$50,000 of machinery.

The Rock Products Co., Lafayette, La., R. F. Voorhies, president, is in the market for rock-crushing and other machinery.

The Menges Motors Co., Greenville, Miss., B. B. Payne, president, and A. C. Menges, manager, will install about \$25,000 worth of equipment in a plant recently acquired for the manufacture of motors. The capital stock is \$1,000,000.

The Go-Ro Mfg. Co., New Orleans, La., capital stock \$750,000, N. G. Goreau, president, will equip a plant for the manufacture of water heaters, installing foundry equipment, drills, presses, stamping, rolling and automatic machinery.

S. W. Day, Alexandria, La., is reported in the market for equipment for unloading sand, gravel, coal, etc., from cars to storage.

The Pacific Northwest

SEATTLE, May 4.

New construction work planned by the railroads in this district calls for heavy expenditures during the year. It is estimated that at least \$1,500,000 will be spent for maintenance of way improvements in the Spokane division alone.

The demand for fruit packing and canning machinery has never been equalled in this section, and large expenditures are also being made for pumping plants and general improvements for irrigation purposes.

The Peninsula Lumber Co., Portland, will enlarge its plant to provide for about 200,000 ft. additional daily capacity. It will be completely electrified.

The Wenatchee Lumber Co., Wenatchee, Wash., has started preliminary work on a new sawmill and box factory. The mill will have a daily capacity of 25,000 ft. and the box factory will be equipped to manufacture 10,000 boxes every 24 hr.

The Leatherman Tire & Rubber Co., Seattle, is completing plans for its proposed tire and tube factory, which will have an initial daily capacity of 500 tires. John A. Leatherman heads the company, which has a capital stock of \$2,000,000.

Swarts & Washburne, Springfield, Ore., plans the establishment of a meat packing and cold storage plant.

The E. R. Thompson Machinery Co., Spokane, Wash., plans to double the capacity of its plant and install equipment for the manufacture of a new patented wrench.

Shumway, Stratton & Wilson, Raymond, Wash., plan the construction of a large sawmill in that vicinity.

The Great Northern Railroad Co. will make improvements costing \$300,000 to its yards at Hillyard, Wash., which will include a new repair shop. E. S. Elliott, Spokane, is general superintendent of the Northwest division.

The Franklin Iron Works, Mount Vernon, Wash., will enlarge its plant by construction of an addition, 20 x 90 ft., two-stories. New equipment will also be added.

The Pacific Machine Shop & Manufacturing Co., Seattle, will erect a heavy timbered machine shop, to cost \$15,000. New machinery will be installed.

The plant of the Bushner Lumber Co., Marshfield, Ore., was damaged \$125,000 by a recent fire. The engine and boiler rooms were destroyed.

Canada

TORONTO, May 10.

Stockholders of the Dominion Bridge Co. at its special meeting in Montreal May 3 unanimously approved plans to form the Dominion Engineering Works, Ltd., for the purpose of taking over the present subsidiary of the company, the Dominion Engineering & Machinery Co., Ltd., which is engaged chiefly in the manufacture of paper-making machinery. In the formation of the new company it is proposed to extend the scope of operations to include the manufacture of hydraulic machinery as well as heavy foundry and machine shop equipment. The board of directors will include Sir Herbert Holt, George Cahoon, Julien C. Smith, Howard Smith and H. Birchard Taylor.

The John Hall & Sons Machine Co., Brantford, Ont., has been merged with the William Tool Co., Erie, Pa. It is stated that a plant will be established in Brantford for the manufacture of tools, etc.

The A. C. Spark Plug Co., a subsidiary of the General Motors Corporation, will establish a manufacturing plant at Brantford, where a site of 16 acres has been purchased. Construction will start at once and it is expected to be completed in 60 days.

The Dominion Steel Products Co., Brantford, Ont., will increase its capital stock from \$1,000,000 to \$1,500,000 to cover extensions to the plant and the installation of additional equipment.

The Canadian General Electric Co., 212 King Street West, Toronto, has awarded contract to the Peter Lyall Construction Co., 61 Front Street West, Toronto, for a manufacturing plant to cost \$250,000.

The Independent Concrete Pipe Co., Ltd., has taken over

the business of the B. Blair Co., Woodstock, Ont., and will manufacture concrete pipe from 6 to 108 in. in diameter. The plant will be extended and new equipment installed.

Plans are being prepared for the erection of a factory on Industrial Island, Vancouver, B. C., for the Pacific Roofing Co., to cost \$125,000. W. H. Whittaker is secretary.

The Cuthbert Co., Ltd., Winnipeg, has been incorporated with a capital stock of \$100,000 by John S. Blair, Homer E. Morrow, Henry E. Ryan and others to manufacture mechanical devices, machines, machinery for loading and handling grain, farm implements, etc.

The Rapid Tool & Machine Co., Ltd., Lachine, Que., has been incorporated with a capital stock of \$500,000 by John MacNaughton, Robert Dodd, James G. Cartwright and others to manufacture gages, tools, motors, engines, machinery, hardware specialties, etc.

Beattie McIntyre, Ltd., Toronto, has been incorporated with a capital stock of \$100,000 by Geoffrey W. Adams, 632 Bank of Hamilton Building; Mervil Macdonald, Edwin Smiley and others to manufacture electrical apparatus, machinery, tools, equipment, etc.

Key-Bolts & Rail-Anchors, Ltd., Toronto, has been incorporated with a capital stock of \$150,000 by John A. Kent, room 43, 44 King Street West; Guy M. Jarvis, Eva M. Gardiner and others to manufacture machinery, tools, etc.

The Peoples Mfg. Co., Ltd., Toronto, has been incorporated with a capital stock of \$300,000 by Russell P. Locke, 120 Bay Street; Grant Cooper, Howard A. Hall and others to manufacture dairy supplies, etc.

The Auto Indicator Co. of Canada, Ltd., Toronto, has been incorporated with a capital stock of \$40,000 by William B. Puckett, 315 Lonsdale Road; Gregory S. Hodgson, Frederick A. Trestail and others to manufacture automobile indicators, safety signals and controls, machinery, etc.

The Lundy Dustless Street Sweepers, Ltd., Brantford, Ont., has been incorporated with a capital stock of \$250,000 by James Harley, Edmund Sweet, Janet Graham and others to manufacture machinery for street sweeping and road making, motors, engines, boilers, etc.

OFFICE CHANGES

The Becker Milling Machine Co. has a new location for its export office at the Grand Central Palace, 480 Lexington Avenue, New York, where it will maintain a permanent exhibit of its machines as well as a complete stock of milling cutters.

The Independent Pneumatic Tool Co., which has been located at 736 David Whitney Building, Detroit, moved May 1 into larger quarters at No. 55 Garfield Building.

The Russell Machine Co., Inc., Pittsburgh, has decided to open a New York office located at 118 East Twenty-eighth Street, rooms 614-615, in connection with the Anco Sales Corporation. Edward C. Angel, a machine tool man of many years experience, will be in charge. The company has been in the used machinery business for over 35 years.

The George T. Ladd Co., Pittsburgh, manufacturer of water tube boilers, has opened a Chicago district sales office at 528 McCormick Building, Chicago, in charge of W. M. McKinstrey, who was formerly Chicago manager for the Page Boiler Co.

The Timken-Detroit Axle Co. announces the opening of an Eastern sales office in the Post-Standard Building, Syracuse, N. Y., in charge of Gordon H. Gannett and L. S. Wiggin. After May 3 the address of the Chicago sales office of the company will be 1403-5 Conway Building.

Merchant & Evans Co., manufacturer, smelter, importer and jobber, Philadelphia, has opened a branch office in Detroit at 926 Chamber of Commerce Building; phone, Main 6914. It will be under the management of R. Frank Smith, who for nearly 20 years was salesman and branch manager for this house.

The Black & Decker Mfg. Co., Baltimore, has removed its Cleveland branch office from 6523 Euclid Avenue to more spacious quarters at 6225 Carnegie Avenue.

The Milholland Machinery Corporation has changed its address to 52 William Street, New York.

The Cleveland Knife & Forge Co. has opened a Pittsburgh office at 1226 Fulton Building, Pittsburgh, in charge of Frank M. Erb as district sales manager. This company has discontinued the operation of its forge plant, and is now devoting its facilities to the manufacture of high grade shearing knives for industrial purposes.

Industrial Finances

Stockholders of the recently reorganized Aetna Foundry & Machine Co., Warren, Ohio, have approved an increase in the capital stock from \$50,000 to \$300,000. Of the increase, \$100,000 will be issued immediately and will be offered to shareholders on a pro-rata basis. Of the first issue, \$60,000 of the proceeds of the sale will be used for working capital, made necessary by a large increase in volume of business, and \$40,000 will be expended for plant betterments. Since the first of the year the company's business has doubled in volume and the capital increase is made accordingly. Full production will be reached July 1, at which time the sales will amount to over three times those for the same period last year. Myron I. Arms, II, former treasurer of the Republic Rubber Corporation, is president of the Aetna company.

The annual report of the International Harvester Co., recently issued, records the further writing off of European war losses. During the past five years the company has written off from current earnings and reserves all losses occasioned by the war amounting to \$45,432,972. The only foreign investment which it carries on its books consists of plants and inventories in Russia and Germany, and these are carried at the small figure of \$6,850,000. Just what might be realized on the funds now in Eastern Europe already charged off cannot be definitely stated, but it is believed that a very respectable total will come back to the company from those sources.

After deducting over \$7,000,000 for war losses out of the 1919 earnings, net profits were in excess of \$12,608,000 compared with \$14,985,000 after writing off \$10,478,000 in 1919. For the year the sales were \$212,700,000, which shows an increase compared with 1918.

The common stock capitalization of the Greenfield Tap & Die Corporation, Greenfield, Mass., has been increased from 80,000 to 120,000 shares to take care of a 50 per cent stock dividend declared payable on July 1 to common stockholders of record June 4.

Stockholders of the Pittsburgh Screw & Bolt Co., on July 2, next, will vote on a plan to increase the company's capitalization from \$3,000,000 to \$4,000,000. On the following day the Pittsburgh Gauge & Supply Co. stockholders will be asked to authorize an increase in that corporation's capital stock from \$750,000 to \$2,500,000.

May 26 and June 21 are the dates set for special stockholders' meetings of the H. H. Franklin Mfg. Co., Syracuse, N. Y., automobiles, for the purpose of authorizing an increase in the preferred stock from \$5,000,000 to \$15,000,000, and in the common from \$2,000,000 to \$15,000,000, the increase in the latter being for the purpose of declaring a 250 per cent stock dividend.

The National Acme Co., Cleveland, for the quarter ending March 31, last, reports net sales of \$4,847,517, as against \$2,700,684 for the corresponding period last year, an increase of \$2,146,833. The net profits for the quarter, before allowing for Federal taxes, were \$1,661,641, as against \$756,631 last year, and equal to \$13.28 per share per annum.

Because its assets exceeded its liabilities, the Chapman Valve Mfg. Co. Indian Orchard, Mass., has increased its capitalization from 5000 shares of common stock, par \$100, and 5000 shares preferred, par \$100, or a total of \$1,000,000, to 10,000 shares common and 5000 preferred, a total of \$1,500,000, and has declared a stock dividend of the additional 5000 shares of common stock, share for share. On Dec. 31, 1919, the total assets and liabilities were \$2,615,179. The current assets were \$487,793, as against current liabilities of \$140,523.

A special stockholders' meeting of the H. H. Franklin Mfg. Co., Syracuse, N. Y., automobiles, will be called within the near future for the purpose of authorizing an increase in capitalization from \$7,000,000 to \$40,000,000. The new capitalization will consist of \$15,000,000, 7 per cent preferred and \$25,000,000 common.

Current Metal Prices

On Small Lots, from Merchants' Stocks, New York City

The quotations given below are for small lots, as sold from stores in New York City by merchants carrying stocks.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipment in carload lots from mills, these prices are given for their convenience.

Iron and Soft Steel Bars and Shapes

Bars:	Per lb.
Refined iron, base price.....	5.25c.
Swedish bars, base price	20.00c.

Soft Steel:

$\frac{3}{4}$ to 1 $\frac{1}{2}$ in., round and square.....	3.52c. to 5.25c.
1 to 6 in. x $\frac{3}{4}$ to 1 in.....	3.52c. to 5.25c.
1 to 6 in. x $\frac{1}{4}$ to 5/16.....	3.62c. to 5.25c.
Rods— $\frac{3}{4}$ and 11/16	3.57c. to 5.05c.
Bands—1 $\frac{1}{2}$ to 6 by 3/16 to No. 8.....	4.22c. to 6.50c.
Hoops	5.57c. to 6.50c.

Shapes:

Beams and channels—3 to 15 in.....	3.47c. to 5.25c.
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Angles:

3 in. x $\frac{1}{4}$ in. and larger.....	3.47c. to 5.25c.
3 in. x 3/16 in. and $\frac{1}{8}$ in.....	3.72c. to 5.60c.
1 $\frac{1}{2}$ to 2 $\frac{1}{2}$ in. x $\frac{1}{8}$ in.....	3.52c. to 5.90c.
1 $\frac{1}{2}$ to 2 $\frac{1}{2}$ in. x 3/16 in. and thicker.....	3.47c. to 5.85c.
1 to 1 $\frac{1}{4}$ in. x 3/16 in.....	3.52c. to 5.90c.
1 to 1 $\frac{1}{4}$ x $\frac{1}{8}$ in.....	3.57c. to 5.95c.
$\frac{3}{4}$ x $\frac{3}{4}$ x $\frac{1}{8}$ in.....	3.62c. to 6.00c.
$\frac{3}{4}$ x $\frac{1}{2}$ in.....	3.67c. to 6.05c.
$\frac{3}{4}$ x $\frac{1}{8}$ in.....	4.07c. to 6.85c.
$\frac{1}{2}$ x 3/32 in.	5.17c. to 7.55c.

Tees:

1 x $\frac{1}{8}$ in.	3.87c. to 6.25c.
1 $\frac{1}{4}$ in. x 1 $\frac{1}{4}$ x 3/16 in.....	3.77c. to 6.15c.
1 $\frac{1}{2}$ to 2 $\frac{1}{2}$ x 3/16 in. and thicker.....	3.57c. to 5.95c.
3 in. and larger.....	3.52c. to 5.30c.

Merchant Steel

	Per lb.
Tire, 1 $\frac{1}{2}$ x $\frac{1}{2}$ in. and larger.....	5.00c. to 5.25c.
Toe calk, $\frac{1}{2}$ x $\frac{3}{8}$ in. and larger.....	6.00c.
Cold-rolled strip (soft and quarter hard).....	12c. to 14c.
Open-hearth spring steel	7.00c. to 10.00c.
Shafting and Screw Stock:	
Rounds	6.25c. to 7.00c.
Squares, flats and hex	6.75c. to 7.50c.
Standard cast steel, base price.....	15.00c.
Best cast steel.....	20.00c. to 24.00c.
Extra best cast steel.....	25.00c. to 30.00c.

Tank Plates—Steel

	Per lb.
$\frac{1}{4}$ in. and heavier	3.67c. to 5.50c.

Sheets

	Per lb.
Blue Annealed	
No. 10	6.62c. to 8.00c.
No. 12	6.67c. to 8.05c.
No. 14	6.72c. to 8.10c.
No. 16	7.82c. to 8.20c.

Box Annealed—Black

	Soft Steel C. R., One Pass, per lb.	Wood's Refined, per lb.
Nos. 18 to 20.....	7.80c. to 9.90c.	
Nos. 22 and 24.....	7.85c. to 9.85c.	9.80c.
No. 26	7.90c. to 9.90c.	9.85c.
No. 28	8.00c. to 10.00c.	10.00c.
No. 30	8.10c. to 10.10c.	
No. 28, 36 in. wide, 10c. higher.		

Galvanized

	Per lb.
No. 14	8.25c. to 10.50c.
No. 16	8.50c. to 10.75c.
Nos. 18 and 20.....	8.65c. to 10.90c.
Nos. 22 and 24.....	8.80c. to 11.05c.
No. 26	8.95c. to 11.20c.
No. 27	9.10c. to 11.35c.
No. 28	9.25c. to 11.50c.
No. 30	9.75c. to 12.00c.
No. 28, 36 in. wide, 20c. higher.	

Pipe

Standard—Steel		Wrought Iron	
Blk.	Galv.	Blk.	Galv.
$\frac{1}{2}$ in. Butt... —36	—19	$\frac{3}{4}$ -1 $\frac{1}{2}$ in. Butt... —15	+ 5
$\frac{3}{4}$ -3 in. Butt... —40	—24	2 in. Lap..... — 7	+ 11
$\frac{3}{4}$ -6 in. Lap... —35	—20	2 $\frac{1}{2}$ -6 in. Lap... — 9	+ 7
7-12 in. Lap.. —25	— 8	7-12 in. Lap... + 2	+ 20

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general headings of "Iron and Steel Markets" and "Metal Markets."

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSE	Per lb.
Bright basic	8.00c.
Annealed soft	8.00c.
Galvanized annealed	8.50c.
Coppered basic	8.50c.
Tinned soft Bessemer	10.00c.

*Regular extras for lighter gages.

Brass Sheet, Rod, Tube and Wire

BASE PRICE	
High Brass Sheet	28 $\frac{1}{4}$ c. to 29 $\frac{1}{4}$ c.
High Brass Wire	28 $\frac{1}{4}$ c. to 29 $\frac{1}{4}$ c.
Brass Rod	26 $\frac{1}{4}$ c. to 29 c.
Brass Tube	42 $\frac{1}{4}$ c. to 44 $\frac{1}{4}$ c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 29 $\frac{1}{4}$ c. per lb. base.
Cold rolled, 14 oz. and heavier, 2c. per lb. advance over hot rolled.

Tin Plates

Bright Tin		Coke—14x20	
Grade	Grade	Primes	Wasters
"AAA"	"A"	80 lb...	11.80 11.55
Charcoal	Charcoal	90 lb...	11.90 11.65
14x20	14x20	100 lb...	12.00 11.75
IC... \$16.50	\$14.25	IC...	12.25 12.00
IX... 18.75	16.25	IX...	13.25 13.00
IXX... 20.50	18.00	IXX...	14.25 14.00
IXXX... 22.25	19.75	IXXX...	15.25 15.00
IXXXX... 23.75	21.50	IXXXX...	16.25 16.00

Terne Plates

8-lb. Coating 14x20	
100 lb.	\$9.33
IC	9.50
IX	10.50
Fire door stock	12.75

Tin

Straits pig	63c.
Bar	70c. to 80c.

Copper

Lake ingot	21c. to 22c.
Electrolytic	20c. to 21c.
Casting	19 $\frac{1}{4}$ c. to 20c.

Spelter and Sheet Zinc

Western spelter	10c. to 11c.
Sheet zinc, No. 9 base, casks.....	14 $\frac{1}{4}$ c. open 15c.

Lead and Solder*

American pig lead	10c. to 11c.
Bar lead	11c. to 12c.
Solder $\frac{1}{2}$ and $\frac{1}{2}$ guaranteed	43c.
No. 1 solder	40c.
Refined solder	38c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.	90c.
Commercial grade, per lb.	50c.

Antimony

Asiatic	11 $\frac{1}{4}$ c. to 11 $\frac{1}{2}$ c.
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Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb... 35c. to 38c.

Old Metals

Prices are generally unchanged and demand is very slow. Dealers' buying prices are as follows:

	Cents Per lb.
Copper, heavy and crucible.....	16.50
Copper, heavy and wire.....	16.00
Copper, light and bottoms.....	14.25
Brass, heavy	10.50
Brass, light	7.75
Heavy machine composition.....	16.00
No. 1 yellow brass turnings.....	10.00
No. 1 red brass or composition turnings.....	12.50
Lead, heavy	7.00
Lead, tea	5.00
Zinc	5.25

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6.00
4.25
0.50
7.75
6.00
0.00
2.50
7.00
5.00
5.25